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PROCEEDINGS

OF THE

AMERICAN ASSOCIATION OF MUSEUMS

VOL. III

1909

THE GETTY CENTER

PROCEEDINGS

OF THE

AMERICAN ASSOCIATION OF MUSEUMS

RECORDS OF THE FOURTH [illegible]

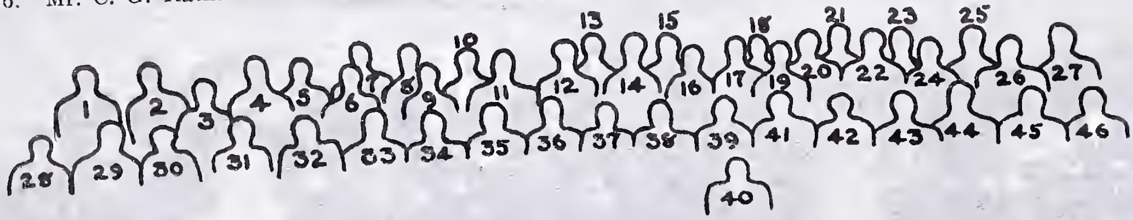
HELD AT PHILADELPHIA, PA.

[illegible] 11-13, 1909

CHARLESTON, S. C.

1909

1. Mr. Earl Douglass
2. Mr. George T. Hastings
3. Miss Katherine P. Irvine
4. Mr. George Francis Dow
5. Mr. H. P. Whitlock
6. Mr. Samuel Henshaw
7. Dr. A. R. Crook
8. Mr. Charles R. Toothaker
9. Mr. Robert Glenk
10. Mr. Adolphe B. Covert
11. Dr. Carlos E. Cummings
12. Mr. Frank H. Severence
13. Mr. Herbert H. Brimley
14. Mr. Sydney Prentice
15. Mr. S. F Houston.
16. Mr. C. G. Rathmann
17. Mr. Boyd P. Rothrock
18. Mr. John J. Macfarlane
19. Mr. Wilfred H. Schoff
20. Prof. William C. Mills
21. Mr. Otto E. Jennings
22. Mr. Charles Louis Pollard
23. Mr. Joseph A. Santens
24. Dr. J. M. Stotsenberg
25. Mr. E. L. Morris
26. Mr. L. W. Jenkins
27. Mr. Fred D. Maisch
28. Dr. Daniel S. Martin
29. Dr. G. B. Gordon
30. Mrs. Cornelius Stevenson
31. Mrs. Otto E. Jennings
32. Mrs. Frederic A. Lucas
33. Mr. Wm. M. R. French
34. Mr. Frederic A. Lucas
35. Dr. W. J. Holland
36. Mr. Paul M. Rea
37. Dr. W. P. Wilson
38. Mr. Henry R. Howland
39. Miss Anna B. Gallup
40. Miss Alicia M. Zierden
41. Mrs. Boyd P. Rothrock
42. Miss Delia I. Griffin
43. Dr. James E. Talmage
44. Dr. Oliver C. Farrington
45. Mr. William H. Goodyear
46. Mr. George P. Goll



PROCEEDINGS

OF THE

AMERICAN ASSOCIATION OF MUSEUMS

RECORDS OF THE FOURTH ANNUAL MEETING HELD AT PHILADELPHIA, PA.

MAY 11-13, 1909

CHARLESTON, S. C.
1909

EDITED BY
PAUL M. REA, SECRETARY
THE CHARLESTON MUSEUM
CHARLESTON, S. C.

THE WAVERLY PRESS
BALTIMORE

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AMERICAN ASSOCIATION OF MUSEUMS

1909–1910

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1908–1911

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Public Museum of the City of Milwaukee, Milwaukee

1909–1912

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Carnegie Museum, Pittsburgh

JAMES E. TALMAGE

Deseret Museum, Salt Lake City

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PROCEEDINGS

OF THE

Fourth Annual Meeting

OF THE

American Association of Museums

HELD IN PHILADELPHIA, PA.

May 11 - 13, 1909

SESSION OF TUESDAY, MAY 11

Morning

The opening session was called to order at the Pennsylvania Academy of Fine Arts, by President William J. Holland, director of the Carnegie Museum, Pittsburgh, Pa.

The roll was called by Secretary Rea and the following is a list of the members present, with the institutions represented by them.

ROLL OF ATTENDANCE

Mr. Thomas L. Austin, Public Museum, Erie, Pa.
Mr. Frank C. Baker, Chicago Academy of Sciences, Chicago, Ill.
Dr. Edwin Atlee Barber, Pennsylvania Museum, Philadelphia, Pa.
Mr. Herbert H. Brimley, North Carolina State Museum, Raleigh, N. C.
Dr. Arthur Erwin Brown, Academy of Natural Sciences, Philadelphia, Pa.
Mr. Stewardson Brown, Academy of Natural Sciences, Philadelphia, Pa.
Dr. Hermon C. Bumpus, American Museum of Natural History, New York.
Mr. T. L. Comparette, Numismatic Collection, U. S. Mint, Philadelphia, Pa.
Mr. Adolphe B. Covert, University of Cincinnati Museum, Cincinnati, O.
Dr. A. R. Crook, Illinois State Museum of Natural History, Springfield, Ill.
Dr. Carlos E. Cummings, Buffalo Society of Natural Sciences, Buffalo, N. Y.

Mr. Earl Douglass, Carnegie Museum, Pittsburgh, Pa.
Mr. George Francis Dow, Essex Institute, Salem, Mass.
Dr. Carl H. Eigenmann, Indiana University, Bloomington, Ind.
Dr. Oliver C. Farrington, Field Museum of Natural History, Chicago, Ill.
Mr. Wm. M. R. French, Art Institute of Chicago, Chicago, Ill.
Miss Anna B. Gallup, The Children's Museum, Brooklyn, N. Y.
Mr. Benjamin I. Gilman, Museum of Fine Arts, Boston, Mass.
Mr. Robert Glenk, Louisiana State Museum, New Orleans, La.
Mr. George P. Goll, Philadelphia Museums, Philadelphia, Pa.
Mr. William H. Goodyear, Brooklyn Institute Museums, Brooklyn, N. Y.
Dr. G. B. Gordon, Free Museum of Science and Art, Philadelphia, Pa.
Miss Delia I. Griffin, Fairbanks Museum of Natural Science, St. Johnsbury Vt.
Dr. Milton J. Greenman, Wistar Institute, Philadelphia, Pa.
Mr. George T. Hastings, Philadelphia Museums, Philadelphia, Pa.
Mr. Samuel Henshaw, Museum of Comparative Zoölogy, Cambridge, Mass.
Dr. W. J. Holland, Carnegie Museum, Pittsburgh, Pa.
Mr. S. F. Houston, Department of Archæology, University of Pennsylvania, Philadelphia, Pa.
Mr. Henry R. Howland, Buffalo Society of Natural Sciences, Buffalo, N. Y
Mr. L. W. Jenkins, Peabody Museum, Salem, Mass.
Mr. Otto E. Jennings, Carnegie Museum, Pittsburgh, Pa.
Mrs. Otto E. Jennings, Carnegie Museum, Pittsburgh, Pa.
Mr. Charles W. Johnson, Boston Society of Natural History, Boston, Mass.
Mr. Henry W. Kent, Metropolitan Museum of Art, New York City.
Mr. Frederic A. Lucas, Brooklyn Institute Museums, Brooklyn, N. Y.
Mr. Fred D. Maisch, Philadelphia Museums, Philadelphia, Pa.
Dr. Daniel S. Martin, Charleston Museum, Charleston, S. C.
Miss Mabel W. McIlvaine, Metropolitan Museum of Art, New York City.
Prof. William C. Mills, Ohio State Archæological and Historical Society, Columbus, Ohio.
Mr. Roy W. Miner, American Museum of Natural History, New York City.
Mr. E. L. Morris, Brooklyn Institute Museums, Brooklyn, N. Y.
Prof. Edward S. Morse, Peabody Museum, Salem, Mass.
Mr. S. R. Morse, New Jersey State Museum, Trenton, N. J.
Mr. Thomas L. Montgomery, Pennsylvania State Museum, Harrisburg, Pa.
Miss Clara N. Perine, Wistar Institute, Philadelphia, Pa.
Mr. Albert Hastings Pitkin, Hartford, Conn.
Dr. Henry A. Pilsbry, Academy of Natural Sciences, Philadelphia, Pa.
Mr. Charles Louis Pollard, Staten Island Association of Arts and Sciences, New Brighton.
Mr. Sydney Prentice, Carnegie Museum, Pittsburgh, Pa.
Mr. C. G. Rathmann, Educational Museum, St. Louis, Mo.
Mr. Paul M. Rea, Charleston Museum, Charleston, S. C.
Mr. John G. Rothermel, Wagner Free Institute of Science, Philadelphia.
Mr. Boyd P. Rothrock, Pennsylvania State Museum, Harrisburg, Pa.
Mrs. Boyd P. Rothrock, Pennsylvania State Museum, Harrisburg, Pa.
Miss Cornelia B. Sage, Buffalo Fine Arts Academy, Buffalo, N. Y.

Mr. Joseph A. Santens, Carnegie Museum, Pittsburgh, Pa.
Mr. Geo. H. Sherwood, American Museum of Natural History, New York City.
Mr. Wilfred H. Schoff, Philadelphia Museums, Philadelphia, Pa.
Mr. Frank H. Severence, Buffalo Historical Society, Buffalo, N. Y.
Dr. Henry Skinner, Academy of Natural Sciences, Philadelphia, Pa.
Mr. Witmer Stone, Academy of Natural Sciences, Philadelphia, Pa.
Mrs. Cornelius Stevenson, Pennsylvania Museum, Philadelphia, Pa.
Dr. J. M. Stotsenberg, Wistar Institute, Philadelphia, Pa.
Dr. James E. Talmage, Deseret Museum, Salt Lake City, Utah.
Mr. Charles R. Toothaker, Philadelphia Museums, Philadelphia, Pa.
Mr. C. H. Townsend, New York Aquarium, New York City.
Mr. John E. D. Trask, Pennsylvania Academy of Fine Arts, Philadelphia.
Mr. B. Meade Wagenseller, Philadelphia Museums, Philadelphia, Pa.
Mr. H. P. Whitlock, New York State Museum, Albany, N. Y.
Dr. W. P. Wilson, Philadelphia Museums, Philadelphia, Pa.
Miss Alicia M. Zierden, Pennsylvania State Museum, Harrisburg, Pa.

President Holland.—"I have the pleasure of presenting to you our host of the morning hour, Mr. John E. D. Trask, secretary and manager of the Pennsylvania Academy of Fine Arts, a time honored and most useful institution. He will welcome us on behalf of the scientific and artistic interests of this good old city."

Mr. John E. D. Trask.—"Mr. President, Ladies and Gentlemen, Members of the American Association of Museums: On behalf of the museums of Philadelphia and of those other institutions which will so greatly benefit by your presence, and especially on behalf of this venerable academy where first we meet, it is my privilege and my great pleasure to bid you real and hearty welcome.

"You will recall that since our city's founder first held conference with the Indians, with happy result, Philadelphia has been preëminently the city of conventions. The Continental Congress and the Constitutional Convention both found inspiration here, and less than a decade ago, almost within a stone's throw, there met the convention which first nominated for national office that eminent gentleman who now awakes the echoes of Africa for the future enrichment of our great national museums. So, I shall hope some day to tell my children, when this Association shall have become even a greater agency for good than now it is, that not the wonder city by the Hudson, nor the iron giant where next you met, nor yet the home of the great west wind could give you full sense of your power; but that in the City of Brotherly Love you first fully sensed the lesson of that real coöperation without which your labor will be in vain.

"During your stay here you will visit our museums, our libraries and our galleries of art; you will learn that in the dissemination of knowledge, in the education of both the senses and the intellect, Philadelphia has always had an earnest interest. You will be told, for we take great pride in it, that since the days of Franklin and of West, we have organized the first association in America for the study of natural history. We have established and maintained the first American art academy, we have published the first daily newspaper on the Western Hemisphere, and, knowing the needs of your own various institutions, you will thank us for having established the first mint for the coinage of United States money. Not only in America are we known but through all the world, wherever men exchange their commodities with other nations, our Commercial Museum has earned respect.

"So you find us in some pride of accomplished work, yet quite aware that the prophecy has been fulfilled that 'Many shall run to and fro and knowledge shall be increased.' From the great store of knowledge which you bring to us we ask a tithe. If in anything we have begun well, help us to its fulfilment. If there be ways in which our aid will serve you it is yours for the asking.

"There is a little truth, I am afraid, in the anecdote of the good Philadelphian who when eating snails in a neighboring city bemoaned the fact that he never had them at home. 'Why' said his host, 'I thought your city full of snails!' 'Oh yes! it is,' was the reply, 'but we really cannot catch them.'

"Ladies and Gentlemen, in the spirit of fullest hospitality we offer to divide with you our snails. Help us to make the capture."

In the absence of the Mayor, who was to make an address of welcome, the Secretary then read the list of names approved for membership by the Council since the last annual meeting.

NEW MEMBERS

Active Members

Miss Helen J. Aitkin, Assistant, Brooklyn Institute Museums, Brooklyn, N. Y.
Mr. Thomas L. Austin, Curator, Public Museum, Erie, Pa.
Mr. Ellsworth Bethel, President, Colorado Academy of Science, Denver, Col.
Mr. Herbert H. Brimley, Curator, North Carolina State Museum, Raleigh, N. C.

Mr. Stewardson Brown, Academy of Natural Sciences, Philadelphia, Pa.
Dr. Carlos E. Cummings, Secretary, Buffalo Society of Natural Sciences.
Mr. R. G. Fuller, Assistant in Anthropology, Peabody Museum, Cambridge, Mass.
Mr. George P. Goll, Assistant, Philadelphia Museums.
Mr. Joseph Grinnell, Director, Museum of Vertebrate Zoology, University of Cal., Berkeley, Cal.
Mr. A. O. Gross, Taxidermist, University of Illinois Museum, Urbana, Ill.
Mr. Henry R. Howland, Superintendent, Buffalo Society of Natural Sciences, Buffalo, N. Y.
Mr. Charles L. Hutchinson, President Board of Trustees, Art Institute, Chicago, Ill.
Miss Florence N. Levy, Editor Art Annual, 546 Fifth Ave., New York City.
Miss Mary T. McAlister, Curator of Museum of Drexel Institute, Philadelphia, Pa.
Mr. H. L. Madison, Curator, Park Museum, Providence, R. I.
Dr. Daniel S. Martin, Honorary Curator, Dept. of Geology, Charleston Museum, Charleston, S. C.
Mr. William McIntosh, Curator, Natural History Museum, St. John, N. B.
Mr. Paul C Miller, Walker Museum, University of Chicago.
Dr. Charles F. Millspaugh, Curator of Botany, Field Museum of Natural History, Chicago, Ill.
Prof. John Pickard, University of Missouri, Columbia, Mo.
Mr. Albert H. Pitkin, Associate of the Wadsworth Athenæum, P. O. Box 867, Hartford, Conn.
Mr. Samuel H. Ranck, Librarian, Grand Rapids Public Library.
Mr. John G. Rothermel, Superintendent, Wagner Free Institute of Science, Philadelphia.
Dr. A. G. Ruthven, University Museum, Ann Arbor, Mich.
Miss Cornelia B. Sage, Buffalo Academy of Fine Arts.
Mr. Frank H. Severence, Secretary, Buffalo Historical Society.
Dr. Henry Skinner, Academy Natural of Sciences, Philadelphia, Pa.
Prof. Frank Smith, Curator, University of Illinois Museum, Urbana, Ill.
Mrs. Cornelius Stevenson, Assistant Curator and Lecturer, Pennsylvania Museum and School of Industrial Art, Philadelphia, Pa.
Prof. John K. Strecker, Jr., Baylor University Museum, Waco, Tex.
Mr. John E. D. Trask, Secretary and Manager, Pennsylvania Academy of Fine Arts, Philadelphia, Pa.
Mr. B. Meade Wagenseller, Assistant, Philadelphia Museums.

Sustaining Members

Academy of Natural Sciences of Philadelphia.
Essex Institute, Salem, Mass.
Museum of the College of Liberal Arts, Northwestern University, Evanston, Ill.
St. Louis Museum of Fine Arts.
Wadsworth Athenæum, Hartford, Conn.

Hon. John E. Reyburn, Mayor of Philadelphia, was then escorted to the front of the room by Mr. Trask.

President Holland.—"Ladies and Gentlemen: It is a great thing to be the governor of one of our American commonwealths, but I sometimes think it is even a greater, a more honorable, and certainly a more difficult position to be in charge of the complicated affairs of one of our great municipalities. Among those who are presiding at the present day, with great dignity and success, over one of the greatest of American cities, is one whom I have the pleasure of presenting to you this morning, His Honor, The Mayor of Philadelphia." (*Applause.*)

Hon. John E. Reyburn.—"Mr. President, Ladies and Gentlemen: I am afraid the Chair is a little too complimentary; at the same time, I wish you to feel that we are very glad to have you here, and to have you see Philadelphia, as well as to discuss the important subjects which bring you together.

"We regard you as friends, interested in many things in which we are interested, rather than as guests, who are not expected to criticise, and we hope that you will feet at perfect liberty to point out whatever you see here which may be changed for the better. We in Philadelphia are interested in the progress and better development which is going on throughout the world at the present day, and we know that you can give us ideas and thoughts which will be of great benefit. We are, therefore, especially glad to greet you this morning.

"It is a bright and beautiful day and, although you have some duties indoors, we hope to show you before the end of the week the park system and the projected improvements of Philadelphia. All those things which pertain to the government of the city are open to you, and we hope that you will carry away a better impression of us from your visit here.

"I thank you again, Ladies and Gentlemen, and Mr. Chairman, for the opportunity you have given me this morning, and I hope you will have a pleasant and profitable visit in Philadelphia." (*Applause.*)

President Holland.—"I will call on a representative of the great body of careworn toilers of New York to respond to Your Honor's kind words of welcome: Mr. Frederic A. Lucas, First Vice-President of the Association."

Mr. Frederic A. Lucas.—"Mr. Chairman: Your Honor, let me correct a little statement of our worthy President. I am not from New York, I come from one of the boroughs that have been annexed to New York, of of which some one has said, 'In the midst of life we are in Brooklyn.' (*Laughter.*)

"A year ago it was my privilege to respond to the address of welcome in one of the newest of our great cities, and today it is my privilege to respond to an address of welcome in one of our oldest cities. Philadelphia has more museums than any other city in the United States. It has a greater variety of museums and more working museums, if I may so speak, and so it is eminently fitting that we should meet in this great city.

"The purpose of our Association is thus set forth: 'The object of this Association shall be to promote the welfare of museums, to increase and diffuse knowledge of all matters relating to them, and to encourage helpful relations among museums and those interested in them.' It seems to me that there can be no better way to encourage these helpful relations than by a bond of fellowship among the many members of our many museums, and a glance at our program shows the extent of the welcome extended to us and the variety of kindnesses to be shown us, a welcome truly worthy of the City of Brotherly Love.

"On behalf of the Association collectively and on behalf of its members individually, I will return our sincere thanks to His Honor, the Mayor, as representing this great municipality, and to Mr. Trask as representing the institutions of art and science." (*Applause.*)

Secretary Paul M. Rea then read the following report:

REPORT OF THE SECRETARY

The Secretary begs to report that the Association has received thirty-two new Active Members and five new Sustaining Members, and has lost by resignation, one, and by death, four Active Members, during the past year. The membership is now 228 against 168, as printed in the *Proceedings* for 1908.

The Secretary regrets to record the death of the following Active Members:

Charles Chauncy Mellor, President of the Committee on the Museum, Carnegie Institute, Pittsburgh.
Dr. Charles M. Kurtz, Director of the Buffalo Academy of Fine Arts.
George Corliss, Assistant in the Art Institute of Chicago.
Prof. Otis Tufton Mason, Head Curator of Ethnology in the U. S. National Museum.

The routine correspondence of the Association has been carried on during the year, and has more than doubled as compared with the previous year.

The second volume of the *Proceedings* of the Association has been edited and published by the Secretary.

As directed by the Association, at its last meeting, the Secretary has undertaken the compilation of a directory of museums of art, history, and science in North and South America. A circular requesting information for this purpose was prepared in consultation with several members, and has been mailed during February, March, and April, to about 640 museums. Replies have already been received from 117. From these returns, an account of each institution will be prepared and submitted in manuscript to the museum for revision before printing. The Secretary takes pleasure in announcing that the Buffalo Society of Natural Sciences has offered to publish this directory for the Association, as one of its Bulletins, in commemoration of the meeting in Buffalo in 1910.

Respectfully submitted,
PAUL M. REA, *Secretary.*

On motion duly made and seconded, the report of the Secretary was approved.

The following resolution, in reference to the deceased members was offered by Dr. James E. Talmage, president of the Deseret Museum, Salt Lake City, Utah, and unanimously adopted:

Be it resolved, That the American Association of Museums learns with sorrow of the deaths announced, and that the Secretary be requested to express to the family of each of the deceased members, the condolence and sympathy of the Association ; and

Be it resolved, That the announcement of death and a brief biographical sketch of the deceased members be published as a necrological record in the next volume of the *Proceedings*.

Brief accounts of the life and work of the deceased members were then given as follows: on the late Dr. Charles M. Kurtz, by Mr. Henry R. Howland, superintendent of the Buffalo Society of Natural Sciences; on the late Mr. George Corliss, by Mr. Wm. M. R. French, director of the Art Institute of Chicago; on the late Prof. Otis T. Mason, by Mr. Frederic A. Lucas, curator-in-chief of the Brooklyn Institute Museums; and on the late Mr. Charles C. Mellor, by President W. J. Holland, director of the Carnegie Museum, Pittsburgh.

In the absence of Dr. W. P. Wilson, the reading of the Treasurer's report was deferred. President Holland then spoke as follows:

President Holland.—"It seems proper for the Chair to express to the

Association his most cordial thanks for their act at Chicago in choosing him for the position he now has the honor of attempting to fill. This action, taken at a time when he was absent in a foreign land, was particularly pleasing."

Reports of committees were called for, and Dr. W. J. Holland, as chairman of a committee to secure for museum officials the benefits of the Carnegie Foundation, submitted an informal report, expressing doubt as to the possibility of effecting the purpose for which the committee was appointed. On motion of Dr. Oliver C. Farrington, by whose suggestion the committee was originally appointed, the committee was discharged with the thanks of the Association.

In the absence of Dr. George A. Dorsey, chairman of the committee to secure second class postal rates for occasional publications of museums, no report was submitted, and the committee was continued.

Mr. Wm. M. R. French, chairman of the committee on free art, reported progress, and the committee was continued.

The report of the Treasurer[1] was then read by Dr. W. P. Wilson, and referred to an auditing committee,[2] consisting of Messrs. F. C. Baker, G. F. Dow, and O. C. Farrington.

President Holland.—"Dr. Wilson, I know I voice the sentiments of the Association when I say that we are under great obligations to you for the kind, faithful, and self-denying manner in which you have cared for the matters entrusted to you. We know that we have in you one of the most loyal and disinterested friends of the movement which we represent."

Mr. Wm. M. R. French then took the chair, while President Holland read a paper as follows:

COÖPERATION BETWEEN MUSEUMS

The number of museums already established in America is great and is destined in future years to become greater. The movement for the establishment of museums may be said to be as yet in its infancy. As instruments for popular instruction and for the elevation of taste and culture, museums are quite as efficient as libraries: the method of teaching by means of objects being frequently even more effective than the method of teaching by books.

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[1] For the report of the Treasurer, see Appendix.

[2] For the report of the Auditing Committee, see p. 71.

Permit me to say at the outset of my remarks that it is one of the delightful features of the work in which we are engaged that a spirit of fraternity and mutual helpfulness has always prevailed among the museums of America. If there be rivalries, they are generous in their character. These relations of cordiality and friendship are destined, we believe, to continue forever.

It is the object of the brief remarks which I am about to make to endeavor to point out some of the ways in which museums may be mutually helpful to each other.

Museums may aid each other by the mutual communication of knowledge obtained by experience. This Association exists fundamentally for this purpose. Our annual gatherings, bringing together the representatives of the various museums of America, at which questions of policy and administration are freely discussed, are calculated to broaden the views and stimulate the efforts of those who participate in the discussions, and to create personal friendships which would not otherwise be begotten. I confess that to me it is a delightful experience from time to time to meet my brethren who are engaged in earnest efforts to promote the good work for the advancement of which we all stand. It seems to me therefore that one of the first things which the museums of America should endeavor to encourage is the maintenance in abiding strength of this Association itself, by which those who are engaged in the practical work of museums are brought together and permitted to see each other eye to eye and face to face. Every museum in America should become a Sustaining Member of this Association and should endeavor to be represented at our annual gatherings by one or more delegates.

Speaking for the institution which I have the honor of representing, I desire to say that it is the judgment of our trustees that it is a wise thing to annually expend a small part of the funds under their control in order to make it possible for a certain number of the staff of the Carnegie Museum to be present at these gatherings. We take account in our budget as one of the items which is to be annually considered, the sending of a delegation from the Carnegie Museum to the meetings of the American Association of Museums. We feel that we are profited; that those who attend these meetings return inspirited, with larger views, and a more thorough determination to achieve success.

A second method in which museums are already coöperating, and in which in coming years they may more fruitfully coöperate, is in freely according to each other facilities for study and research. I wish to bear testimony in this connection to the magnanimity and kindness which prevails among the scientific men of America, especially as represented in the museums of the country. Mutual helpfulness seems to be the aim and ambition of our brotherhood. And this is true, I may say, not only of the museums of America, but of the museums of the world. When there is need of counsel or of access to collections or literature for purposes of study, the brotherhood of scientific men is always ready to give aid. However we may differ in our interpretation of facts and in our position as specialists in particular cases, the spirit of mutual helpfulness prevails among us.

Another way in which museums may aid each other, paradoxical as it may appear, is by letting each other alone. Let me explain myself. When an individual or an institution has addressed itself to a given task, and that fact becomes known, its priority of attempt should be respected as much as we naturalists are given to respecting priority in nomenclature. To translate what I have said into concrete terms, I claim that it is the duty of scientific men and of scientific institutions when a certain work has been undertaken not to interfere with or unnecessarily duplicate that work. This is more particularly true in the domain of research. The field of investigation is so wide, the problems set before us are so numerous, the territory to be explored has been so little cultivated, that it appears to me to be a waste of the energies at our command for more than one individual or institution to undertake to do precisely the same thing. The museums of America in their work of scientific research should by common consent agree to select those problems which they may respectively be best fitted to explore, whether because of the possession of resources or because of their location, and in the investigation of such problems they should mutually respect each other and not attempt in the spirit even of a generous rivalry to oppose each other.

This leads me to speak of the great importance of attention on the part of each institution to its peculiar local problems. It seems to me that the different museums of America will each be doing the most for the advancement of science in general when, so far as the work of scientific research is concerned, they bend their energies to the exact study of the natural phenomena of the several regions in which they are located. There will thus be acquired a minute acquaintance with the region in which each museum is located and this knowledge will become available for the use of the entire scientific world.

A notable beginning in this direction as you are all aware has been made in Chicago, and when a little more than ten years ago the Carnegie Museum was established in the city of Pittsburgh and the present speaker was called to plan for its administration, it was resolved that we would make the study of the upper valley of the Ohio from every point of view one of the prime objects of our activity, and we have been for the last ten years studying the flora, the fauna, and the geology of the region with care. In this work we have had the advantage of the services of several acute observers and indefatigable collectors and, when it is concluded, I trust that the knowledge which we shall have gained of this important territory will be as full and exact as the requirements of the most careful and diligent student could demand. Dr. Arnold E. Ortmann with characteristic enthusiasm has prosecuted the work of research along the river systems with a view to preserving for the future a record of the life which once teemed in those rivers, but which is rapidly disappearing owing to changing conditions. I may say that the work was begun none too soon. Mr. Jennings with equal assiduity has been engaged in studying the flora, which like the fauna has already in part perished. Dr. Raymond is engaged in working out the stratigraphy and invertebrate paleontology of the region, and has learned many interesting things, which had heretofore eluded those who were officially engaged in the various geological surveys which have been made from time to time. A diligent band of collectors has assembled the mammals, the birds, and the insects of the territory. Only recently I have been able to publish an initial list of the lepidoptera of the region, prepared by Mr. Henry Engel, showing that there are within a radius of only a few miles of the city of Pittsburgh over seventeen hundred species belonging to this order of insects. I merely allude to these facts as concretely illustrating the manner in which a museum in a given locality may, if it will, explore the region, thus laying foundations for the broadening of our knowledge of the entire continent. The facts ascertained by us will gradually become available for the use of all.

And now being engaged in this important local work, I wish to say that I do not think that any one here would accuse me of maintaining a false attitude, if I should say that while we are doing this work, we should expect our brethren to regard what may be termed our territorial prerogatives. Where a museum possesses the means and the trained workers to thus carefully study a region, there should be no conflict directly or indirectly with its efforts. This is not said because of a desire in any sense to monopolize the field, but because of the desire to prevent an unnecessary and wasteful expenditure of means, which, viewing the work of the museums of America as a whole, are never in excess of the demands of legitimate work. One of the best ways in which museums may co-operate with each other is thus seen to be by letting each other alone.

Another method in which museums may coöperate with each other is in the exchange of duplicate material. In reference to this, very little need be said. The system of exchange between museums is well established and relations of exchange exist between almost all well organized museums.

The conduct of exchanges, while one of the most fruitful methods of increasing the value of collections, is always attended with a certain amount of labor and considerable expenditure of time. It also calls for a large degree of careful kindness and consideration. In order to successfully exchange material the spirit of mutual concession and good nature must prevail. In an experience involving relations of exchange with other naturalists covering forty years, I can recall but one case in which a difficulty arose, and that was in dealing with a man who has long since joined the great majority, with whom I think every specialist, who was brought into relation with him, expected to have, and did encounter, trouble. He belonged to that very unfortunate class, fortunately small in number, who regard everything which passes through their hands as having value beyond diamonds and rubies. The collection he made, which is now the property of one of the great museums of this country, was largely built up of material which he obtained from brother naturalists by cajolery or browbeating, and I have reason to believe in some cases by the wilful abstraction of specimens from the cabinets of fellow-workers, who were so unwise, until they found him out, as to give him access to their collections, bits of which disappeared in his pockets or in his hat. Men like this fortunately are not common.

A service in which museums of art may profitably engage is the exchange of collections or parts of collections for temporary display. The museums of art have an advantage in this matter over those museums which are devoted to the natural sciences. It is easier to send pictures and statuary from one place of exhibition to another, than to send natural history collections, which are often liable to very great injury by shipment from place to place.

Another method in which museums may coöperate effectively is in the exchange of the services of competent men. If it has been found advantageous for the universities on both sides of the Atlantic to exchange the services of distinguished professors, why should not the same method to a certain extent and within certain limits exist between museums? Not every museum is able to maintain a large staff of carefully trained scientific experts. One institution may have a man who excels in one direction; another may possess a man who excels in another direction.

It is desirable and I believe it is feasible, for museums to exchange the services of experts, or allow them to have for a little time roving commissions. Referring again to our personal experience in the Carnegie Museum, I may say that we have been happy in being permitted to make arrangements with one of our great universities for the employment, for a portion of his time, of one of the most eminent ichthyologists in America, who has consented to work up our collections for us. Here is a concrete illustration of the matter concerning which I am speaking. It is not possible or desirable for this distinguished man to leave the position which he occupies, but it is possible for him to devote a portion of his time to the work which we desire to have done, and this he has agreed to do. A similar arrangement in another department of study is about to be made. Such arrangements have been made in times past and are being made by a number of other museums in this country. I hold that this is an important and useful form of coöperation which should be encouraged and to some extent relied upon.

I conclude my remarks as I began them, by alluding to the extremely friendly and helpful spirit which prevails among our American museums, large and small, and by asserting the belief that it is as we thus stand together in harmonious relations that the great interests which we represent may best be conserved.

Dr. Daniel S. Martin, honorary curator, department of geology Charleston Museum, Charleston, S. C., then presented the following paper:

COÖPERATION AMONG COLLEGE MUSEUMS

The American Association of Museums has entered upon a very large field of useful and much needed service, and should have the earnest support of all who are interested in the preservation and the utilization of scientific or art material for the benefit of the public—whether as teachers, curators, or collectors. The work of the Association thus far has related principally to the larger museums, but there is also an extensive field in connection with the numerous body of smaller museums of science belonging to the colleges, distributed all over the country, in which the influence of such an Association as this can be of great value. The title of this paper, "Coöperation among College Museums," expresses the end and the method which I have in view, but I must preface and accompany these points with a few general remarks.

There are hundreds of colleges and similar institutions scattered throughout the United States, in all of which some science is taught, and some equipment provided, more or less adequate for illustration thereof. But many of these institutions are in small places, some of them quite remote, and the contents of their museums are known only to their own students and faculty. To the public and to students of science they are largely inaccessible and almost wholly unknown. While many of these collections are small and trivial, some are large and valuable, and all are apt to contain some material of special interest, local or otherwise, that is like buried treasure. I speak from experience on this subject, having taken an interest therein for years and having visited and examined the collections at many colleges, both in the North and in the South. All over the country there are these small museums, unknown and unrelated to each other and to the scientific world, and yet often containing interesting and valuable material, unappreciated even by its possessors. It is certainly much to be desired that this condition of affairs should be improved and with this object I am addressing you to-day.

The ordinary college museum need not be large. As has been well said by Professor A. C. Moore, of the University of South Carolina, what is really important for the purposes of the average college is a small but well-selected exhibit of characteristic specimens, to illustrate to students the principal objects in any branch of science which they are studying, thus supplementing and explaining the statements and figures of the text-book or the lecturer, and making them real in the student's experience. It should also give practical familiarity with the natural objects which students are likely to encounter, not only those rare and remote, of which he reads and hears—so far as they are important and so far as it has the means to procure them—but also it should illustrate as fully as possible the natural objects of the region where it is situated, the common minerals, rocks, fossils, and the fauna and flora of the locality.

This latter aspect should be emphasized and every institution should be encouraged and stimulated to make systematic and thorough local collections in all departments. In this manner, much valuable material may be secured at little or no expense, and important data, as to distribution and the like, be obtained and recorded. To some extent, indeed, this has been done but the lack of coöperation between institutions and the fact that, as a rule, no one of them knows what even its neighbor possesses, have prevented any systematic or important general result from what has actually been accomplished. This association might well organize some plan for the improvement of these conditions. The publication of the Museum Directory, now in preparation, will be the first great step in this direction and will supply the first pressing need of a basis of information as to the contents of our numerous museums.

This will be only a starting point, however. There should next be some concerted policy, some division of labor, among the different colleges of a region, or of a state, whereby great advantages might be secured. I hold that every museum should seek to gather and exhibit scientific material with reference to some definite object, and not merely in a general and miscellaneous way. Of course, every museum needs, and should have, general collections, to give to visitors and students some idea of the richness and variety of objects comprehended in the great divisions of nature, and to enable them to become acquainted by actual observation with the plants and animals of distant lands and the minerals and fossils of remote and peculiar localities. So far as this is attempted or realized, however, there is of necessity a certain sameness in the contents of museums, and one is to a large extent like another. The same is equally true of libraries and art collections, also.

But apart from this general work, every museum should aim at a speciality of its own—some branch or department in which it should have, and be known to have, a distinctive character, and to possess material and afford opportunities that cannot be found elsewhere. The first and most obvious form in which this aspect of a museum's work can and should be cultivated, is in the matter of local collections; the illustration, with utmost fullness, of the fauna and flora, the minerals, rocks, and fossils of the neighborhood.

Aside from this, however, the direction which this specialization should take will naturally be determined by various conditions. Among these may be noted a few of the most obvious, such as (1) the particular taste and capacity of the professor in charge—whether a geologist, a botanist, or the like; (2) the situation of the institution as regards peculiar facilities in any department; (3) the possession already of valuable collections gathered, purchased, or presented in time past. Any one of these conditions may well determine the particular lines along which the institution should develop its museum.

A notable illustration of this general principle, under the second head, is found in Amherst College, where in addition to an excellent general museum, there is the great and celebrated collection of reptilian footprints from the Trias of the vicinity—a collection unique and unparalleled, and known to be such throughout the world. Few institutions indeed have such an opportunity, or anything like it; but something of a similar kind can be attempted by many, on a humbler and smaller scale of course, but along the same line of full and careful illustration of local features.

The possession of collections formerly made or acquired, is a point which I wish to dwell upon in yet another aspect from that just referred to. Not only does it furnish a basis, and so indicate a direction, for further development, but it imposes an obligation thereto. The possession of a valuable collection in any department is in itself a trust, a heritage, from the past for the future, and involves a responsibility not only for its proper care and maintenance, but also, as far as possible, for its extension and improvement. This is an aspect which seems to be seldom recognized, but to my mind it is exceedingly important.

The collections acquired by an educational institution are not only a part of its equipment, but they are also a part of its history. They have been gathered or given, perhaps long since, by members of its faculty, by trustees, or by graduates, and express their interest in the institution, their love for it, and their desire and endeavor for its advancement. There is an element of sacredness in these collections therefore, which should never be overlooked or disregarded. And yet how rarely is this aspect recognized! Often no formal nor permanent record is kept of such acquisitions and, after some years, no one knows anything about them, save perhaps a vague tradition that such and such objects were collected or presented by "old Dr. So-and-so" years ago. The new professor moreover, coming to such an institution, too often seems to feel no interest in the historic relations of the material that he finds there, or in what may be called the personal aspect of it, as expressing and embodying the labor of those who have preceded him. Because it is not arranged or classified according to the latest views which he has studied, it has for him little, if any, value, and no claim on his interest. This is not right; it is an injustice to former laborers, who were as earnest in their time and with their opportunities, as any of their successors are, or can be, now. Of course their work must be revised and brought up to date, but this should be done with more recognition and respect than is frequently displayed. The historic element and the personal element in such possessions of any institution, ought to be honored and regarded by all who have to deal with them. I desire to press this point upon the attention of the members of this body, in the hope of arousing and developing a sentiment which seems to me highly desirable.

But, to return to my main subject, why should not the institutions of a given region—say perhaps of each state—arrange for some form of concerted action in the matter of their scientific collections? As I have already said, each must have certain generally similar features, but each should also aim to develop especial excellence along certain particular lines, determined by some one of the causes to which I have alluded. When the Museum Directory has been published, it will be possible to know, for the first time, what each institution possesses. Then, by some system of conference, each institution could select some one or more departments in which it could specialize most readily and advantageously. Thus the whole field of scientific illustration could be in some fair measure covered by the several institutions of a state, each taking some portion as its own share, instead of attempting to do a little in all, or in many, departments. I have in mind here, the state of South Carolina, and though I will not mention any of its institutions by name, yet I can see how easily and how well such a "division of labor" could be arranged among some of them, to the advantage of all. The same principle, I believe, could be applied to almost any state in the Union. So far as I know, this suggestion has never been made before. It may be impracticable, but I do not think so. I desire in any case to present it for the consideration of this body.

Two things at once suggest themselves, in anything like such a system of coöperation among college museums. One of these is obvious and familiar—the exchange of duplicate specimens. There is a vast amount of unused and even wasted material of this kind, that, by some well-considered system of exchange, could be made valuable and instructive. The other point is one of some delicacy and difficulty: it relates to the retention, by an institution, of specimens which are not duplicates, and which are not of real value or use where they are, but yet might be of service elsewhere. If the principle of division of labor, above suggested, were to be adopted, this question would assume a more definite form. It is unfortunate, to say the least, that a few rare or peculiar specimens should be buried in some out-of-the-way place—mere unused curiosities—when they would have a tenfold value in connection with other material of the same character, with which they properly belong. The proposal to transfer such specimens from a collection where they have little value to one where they would have much, would involve some difficult questions. It would interfere to some extent with the historic and personal element that I have already spoken of as belonging to college collections and it would interfere more seriously with the legal superstition of some trustees—who know little and care less about the value or utility of scientific specimens, but who hold strenuously to the idea that nothing that has ever come to an institution must be permitted to leave it, no matter how little use is made of it or how little care is taken of it, or how valuable it might be elsewhere, a very "dog in the manger" policy. Both of these obstacles, however, could be avoided by some system of loan or deposit, agreed upon between institutions, instead of actual transfer.

In closing this paper, with its few and perhaps novel suggestions, I can but express the hope that it may lead to some improvement in the character and the relations of our many college museums, now so disconnected, so little known, and often so little prized and so poorly cared for. I would urge upon the scientific professors in our colleges, moreover, the obligation and the responsibility which rests upon them for the better care and the higher appreciation of the scientific collections belonging to their institutions, as a part of both their history and their equipment, as a heritage and as a trust. Nay more; the college cabinets should be a matter of pride among all the friends of the institution, and among the students. The possession of a well-selected and well-arranged college museum, and its excellence in some special department, recognized among other institutions, ought to awaken at least as much interest and pride among any body of intelligent young men as the winning of a ball game or a "cane-rush." It should seem so, unless the *humanities* in education have been wholly trampled out by the *brutalities*. Perhaps this is one direction in which the American Association of Museums may serve the cause not only of science but of civilization.

Mr. Frederic A. Lucas (*Brooklyn Institute Museums*).—"It has always been my feeling that type specimens should be put where they will do most good, and I would like to give a concrete instance: Dr. Allen sent to the American Museum the types of Spermophiles of the Brooklyn Museum, instead of retaining them where they would have been unrelated to other specimens."

Secretary Rea.—"Although I agree entirely with the desirability of concentrating type specimens in the larger collections, I well remember the impression made upon me in my college days by the type specimen of *Dromatherium sylvestre*, the earliest mammal known in North America. This was the only important type specimen owned by the College, and would undoubtedly be of greater service to students in some larger museum, but in this small college it had an important function in impressing upon students the importance of type specimens."

Dr. Oliver C. Farrington (*Field Museum of Natural History, Chicago*).—"There are many excellent college museums; almost every college passes through a spasm of giving, but the enthusiasm soon lapses, and we all know that the average college collection becomes dingy and commonplace, is uncatalogued, and is housed in a room which is hot in summer and cold in winter. Such museum collections are seldom widely known. One of the finest collections of meteorites in the world is contained in such a museum, but is so incompletely known that it failed entirely of mention in a catalogue of meteorites of the world, prepared by a German author. I feel sure that there is much important material hidden away in college museums, and if college officials could be brought to realize, by such statements as have been made in these papers, the educational value of their museum material, there would be a great improvement in the care of such collections."

Mr. H. P. Whitlock (*New York State Museum, Albany*).—"Complications sometimes arise in determining the field of activity of museums by their territorial position. In my own state, New York, we have in New York City the American Museum of Natural History, covering the entire United States, in fact the two Americas; the New York State Museum in Albany, whose special field is the State of New York; and in Buffalo the Academy of Natural Sciences; each with a particular function, and it seems to me that any attempt to make a territorial division can only result in friction."

Mr. Charles R. Toothaker (*Philadelphia Museums*).—"There is a sentiment among all the speakers that it is of value to scientists to know what good specimens are in existence, and one of the important things that our Museum Directory is to do is to disseminate information as to where the good collections are. It has been pointed out that there are good collections in colleges as well as in museums and there are also good collections in private hands, and it might add greatly to our interest to have the names of private collections also added."

In the absence of the author, the following paper, by Dr. Edwin A. Barber, director of the Pennsylvania Museum, was then read by title:

THE NEED OF COÖPERATION AMONG MUSEUMS

Ten years ago coöperation among American museums was but a dream of the future. Each institution was a law unto itself, in consequence of which the trend was toward stagnation and constantly narrowing policies, and the accumulation of reproductions, forgeries and other undesirable material. Six or eight years ago our slumbering museums commenced to show signs of increasing activity, and gradually a spirit of friendly rivalry began to be developed. This awakening was largely brought about by the introduction of museum bulletins which extended the influence of their respective institutions beyond the narrow confines of their immediate communities. The petty jealousies, which once marked the management of local museums in this country, are rapidly disappearing before the development of a broader and more liberal policy whereby inter-institutional relations are now being established. This great change in sentiment has resulted in the organization of the American Association of Museums. American museums have, therefore, already shown a more liberal spirit than those abroad. European museums are, as a rule, still unprogressive and self-centered, and disinclined to render assistance or furnish information. Shining exceptions are those of Hamburg, Dresden, and Berlin. Letters of inquiry addressed to others are almost invariably ignored. Our own experience has been that out of some hundred letters asking for enlightenment on certain points and requesting an exchange of publications, less than ten per cent have elicited replies of any sort, notwithstanding the fact that they were written in both English and foreign languages.

Almost every museum in this country possesses at least one recognized expert in some particular field of research, but no single institution includes on its staff specialists in all of the branches represented by its collections. The field of American research in the arts and sciences, however, is so comprehensive that competent experts can be found in our institutions of learning whose combined knowledge should cover almost the entire ground. It only remains to discover who these specialists are, and to enter into a mutual agreement whereby a general interchange of courtesies may be brought about. For several years the Pennsylvania Museum has maintained a Bureau of Identification through which thousands of objects belonging to those departments in which the members of the staff have specialized, have been passed upon for the benefit of other museums and collectors, receiving in exchange valuable assistance in other branches of art.

The advantages of a general interchange of services between museums will be three-fold. First, each museum, whose staff does not include experts in certain branches of art or science, will be enabled to procure the advice, and possibly the periodical presence, of specialists in those departments, without the expense of maintaining a large permanent corps of assistants. In the second place, by the establishment of inter-institutional relations, any museum may arrange to send material to another for identification. Finally, this mutual interchange of services will prove to be of the greatest benefit to specialists themselves, bringing them into close touch with the collections relating to their respective departments in the principal museums, thus familiarizing them with all similar material in this country, and greatly increasing their knowledge in their special lines of research. The experience of the Pennsylvania Museum in this direction has been so satisfactory that I am deeply impressed with the importance of securing the joint action of all institutions represented by this Association. I have sounded the directors of some of our foremost museums in regard to their willingness to enter into some mutually advantageous arrangement whereby an interchange of expert services may be brought about, and in almost every instance have received a favorable reply. To accomplish this, it seems to me the first step will be to ascertain from each institution what specialists are attached to its staff. The second will be to learn in what special departments these museums are willing to render assistance to others. Finally, it will be necessary to reach an understanding on which such interchange of courtesies may be consummated.

In suggesting a plan of coöperation, I have taken the ground that it should be possible to find experts somewhere in this country whose special knowledge extends to practically every department of science or industry with which our museums are concerned. Many eminent authorities in various branches of science and art, connected with American museums and learned societies, could be named, but I shall not present a list here. Among the subjects in which our specialists have attained distinction, however, may be enumerated ethnology, zoölogy, ornithology, entomology, paleontology, conchology, botany, geology, and mineralogy; painting and sculpture; Japanese, European and American ceramics; Egyptian, Persian, Chinese, Japanese, Greek, and Roman art; American archæology, enamels, lacquers, metal work, Oriental carpets, glass, European prints, arms and armor, musical instruments, and basketry. In these departments it should be possible to arrange a plan for determining and classifying material for any institution needing assistance. There are, however, other branches of human industry in which coöperation may be more difficult, such as engraved gems and textiles, but there are, doubtless, students in this country who have given some attention to these subjects also. It remains to ascertain who they are.

The Pennsylvania Museum has, at various times, been invited to join forces with other museums in this country for the employment of European authorities in certain departments of art. In one case it was ascertained that the professional fees and expenses of such an expert, for one month, would amount to about $3000, an average of $100 per day. It was proposed that these institutions should combine and arrange an equitable allotment of expenses. This would mean an expenditure of $600 each by five museums, to secure six days of service, or $1000 each by three institutions, for ten days. This would terminate the transaction and at the expiration of the time the specialist would return to Europe. The institution with which I am connected took the ground that the $600, or $1000, or whatever the amount might be, could be used to much better advantage if the interested museums should combine to employ American experts, or even to send the most promising American specialist abroad to study his subject thoroughly. The advantages of this plan would be manifold. A trained expert would thus be permanently secured for this country, whose services would be available from time to time, at a greatly reduced cost, for those museums entering into such an agreement.

It is the manifest duty of public museums to render every assistance possible to each other. All should work toward the same end, the diffusion of good art among the people at large, as well as among those in their respective communities, not merely for the purpose of gaining the foremost place at the expense of the less favored. The most progressive institutions of learning today are permitting their eminent specialists to hold chairs and deliver lectures in other institutions. It is not unusual to see the names of the same scholars in the printed lists of lecturers in several colleges. This practice is increasing with the broadening of educational methods, and the exchange of lecturers between some of the American and European universities has been arranged for the present year. Why should not the same plan be adopted by our principal museums? If a student, after many years of special investigation, becomes a recognized authority in any particular department of knowledge, why should he not be permitted to extend his field of usefulness by giving at least a small portion of his services to other institutions, say one day a month, two or three days in each quarter, a week during the year, or any reasonable period of time which could be mutually agreed upon. Such an arrangement could be entered into without detriment to those museums to which experts are attached. The benefit to all the museums concerned, as well as to the specialists themselves, would be incalculable.

In many other ways American museums can work together to advance the cause of education. Every museum accumulates from time to time duplicate specimens which cannot be exhibited, but which would be most acceptable in filling up gaps in the collections of other museums. Redundant material which is not needed by one museum would be most useful to another. In the case of the Pennsylvania Museum, the retired duplicates now in storage would be sufficient to stock a new museum, and the same condition doubtless exists in other museums. The adoption of a system of exchange would be beneficial to all concerned.

The disposition of unexhibited material may be carried a step further. It frequently happens that certain museums which are not in a position to offer an exchange, can use to advantage collections or groups of objects which have been retired by others. This material may have been acquired under such conditions that it cannot be disposed of by sale or gift, but there is usually nothing to prevent its being transferred for an indefinite period as a loan to be exhibited in the name of the lender. The Pennsylvania Museum retains control of several such collections which are at present deposited in other institutions on loan and can be recalled should a contingency arise at any time making such action necessary. This emergency, in some cases, may never occur, so that the loans may be considered in effect permanent. By this plan the borrowing museum and its constituency may enjoy the use of the material, while the legal owner is relieved of the necessity of providing storage room for its safe keeping.

Let us work together with a view to the mutual strengthening of our educational exhibits, the correction of attributions, the revision of descriptive labels, the elimination of forgeries, the presence of which always tends to cast a reflection upon the fitness of curators in charge. A great European authority, who visited this country a few years ago, was greatly impressed by the large number of forgeries and reproductions he found in all of the art museums which he visited. Observation forces us to admit the unpleasant truth that there is probably no art museum in America which is entirely free from these worthless deceptions, and it is often true that those museums which claim the most for their collections possess the greatest number of imitations, posing as genuine antiques. This is particularly true of ceramics. It was recently stated by a French newspaper that the sale of spurious Sevres porcelain alone nets the counterfeiters in Paris 16,000,000 francs each year, and yields the retail dealers in Europe and America the enormous sum of 48,000,000 francs, or $9,600,000 annually. Almost every American tourist who returns from abroad brings with him some of these worthless fabrications, many of which, sooner or later, find their way into our public repositories. There is scarcely a museum in this country that does not contain imitation Capo-di-Monte, Sevres, and Lowestoft porcelain, and forgeries abound in furniture, glass, textiles, classical antiquities and other articles. The presence of a single forgery in a public collection is more injurious to the reputation of a museum than incorrect attributions or defective classification.

Every museum is strong in some special department where others are weak, and vice versa. The equalization of all departments and the weeding out of spurious examples can only be effected by a combination of interests. No single museum can accomplish this unaided. The field is too extensive to be thoroughly covered, under present conditions, by the staff of any one museum in this country. Only by general coöperation will it be possible to reach that state of efficiency which will insure the dissemination of truth among the people, for the public naturally looks to the museums to furnish authoritative information on those subjects which their collections are intended to illustrate.

If these suggestions should meet with the approval of the Association, I would suggest the appointment of a committee to confer with the authorities of the different museums here represented, looking to the formulation of a plan whereby such coöperation may be effectively established.

President Holland.—"We will now hear a paper by Mr. Charles Louis Pollard, curator-in-chief of the Staten Island Association of Arts and Sciences."

THE STATEN ISLAND MUSEUM

On May 23 the museum which I have the honor to represent will have completed the first year of its existence as a public institution. Before speaking more particularly of its work and of its scientific collections, let me outline the history of the organization to which it owes its foundation.

In September, 1881, a group of about twenty residents of Staten Island, including both professional and amateur biologists, organized the Natural Science Association of Staten Island. The following year a permanent meeting room was offered to the new association by the trustees of what was then the village of New Brighton and for fourteen years monthly meetings were held in Village Hall.

The charter members entered earnestly into the spirit of the organization and local collections in all branches of biology were contributed as the foundation for a museum, although at that time, few, if any, of the members dreamed of the possibility that this museum would ever become more than a private study collection.

In 1885 the Association was incorporated, its object, as stated in the charter, being, "to collect and preserve objects of natural science and antiquity, with special reference to local matters, and to diffuse correct knowledge in regard to same, by means of publications, meetings, and public lectures."

Like all scientific organizations, the Association passed through a period of depression and inertia, its membership declined, its meetings were poorly attended, and about ten years after it had been founded it was threatened with speedy dissolution. But the splendid courage and tireless energy of a few hard workers prevented this disaster, and even succeeded in maintaining, with tolerable regularity, the *Proceedings* whose publication had commenced in 1883. A particularly happy choice of a new president about this time caused the tide to turn, and in 1896, when the Association finally vacated Village Hall to take up quarters in the new Staten Island Academy, the membership had reached high-water mark, and the collections were expanding into a museum of ample proportions and considerable value. An extensive exchange of the *Proceedings* had also resulted in the building up of a fair sized library, containing a number of complete sets of periodicals. In view of these conditions it was not many years before the Academy room became too crowded for use except as a store room.

The movement for wider activities and broader scope in the affairs of the Association, looking toward the establishment of a public museum, began to take shape in the summer of 1904. On May 17, 1905, the Association was re-incorporated as the Staten Island Association of Arts and Sciences. The charter was liberal in its provisions, authorizing the Commissioners of the Sinking Fund to provide quarters for the Museum in the newly erected Borough Hall, and empowering the Board of Estimate to appropriate annually a sum not exceeding $10,000 for care and maintenance. The President of the Borough, under authority from the Sinking Fund Commissioners, assigned a room on the third floor of Borough Hall to the Association, and in July, 1907, the collections were moved from the Academy into their new quarters. The same year an appropriation was made for furnishing and equipping the room, and within a short time contracts were let for the exhibition cases and other furniture. As the entire work of preparing and installing exhibits, as well as attending to administrative duties, fell to the task of the curator, with such occasional volunteer assistance as he could obtain from members of the Association, it was some months before the Museum was in a condition to be opened to the public. On May 23, 1908, however, the formal exercises were held, the Museum being accepted on behalf of the city by Borough President Cromwell, and the principal address being delivered by Dr. F. A. Lucas, of the Brooklyn Institute, who has, from the inception of the Museum, been our constant friend and has afforded incalculable assistance to us in many ways.

The idea of a museum on Staten Island, and above all, a museum located in Borough Hall, is something that requires time for our people to grasp. After the crowd of the first few days, drawn largely by curiosity, the attendance fell off during the hot summer months, as might have been expected. From September on, however, the attendance began slowly but steadily to increase, until in December and January a constant average of nearly thirty persons daily visited the museum. Yet it has only begun to reach the general public, for it is an almost daily experience that we receive visitors who have never before heard of the institution. The majority of our visitors are, of course, children, mostly those in the medium grades of the public schools. As a rule, they are more quick to grasp the salient features of the educational exhibits than their elders. The Staten Island public has not yet caught the museum idea. Our distance from the great public institutions of Manhattan and Brooklyn has prevented that close acquaintance and interest in museum work which is felt by the people of those boroughs, and to many of our citizens who have not kept pace with the great strides in museum economy the word still means simply an assortment of curios. It has been our earnest effort to educate the public mind in this respect, and there are indications that our labors are not being wasted.

The Museum occupies a room about 100 feet long by 25 feet in breadth, a small area at one end being partitioned off to serve as an office and work room. By far the larger proportion of the collections are in storage, as there is neither floor space nor case room for their proper display. The show cases are of two types; an all glass upright, six feet in height by one foot deep, provided with adjustable plate glass shelves; also a flat table case, two and one-half by five feet, carrying two deep drawers beneath for study series of specimens. These cases, being units, can be placed together in any combination, and the uprights are sufficiently low in height to permit easy inspection of articles on the topmost shelf. The wood work is weathered oak. The south wall of the room is occupied for its entire length with built-in book shelves, containing the Association library, which now numbers some 4,000 volumes.

The collection of antiquities naturally excites the most local interest. This includes a number of distinctive Staten Island relics, such as the last of the old milestones which marked the post road to Philadelphia, the lock and hinge from the door of the Old Red Jail, and the bell from the old Court House. Many relics of revolutionary battlefields are also displayed. In ancient documents and manuscripts the museum is remarkably rich, and it has nearly complete files of various Staten Island newspapers that have long since passed out of existence. Closely connected with these exhibits are the various antiques to be seen in the Art Loan Collection, embracing china and metal ware, old costumes, hand woven garments and other family heirlooms. These loan exhibits are changed at frequent intervals. Indian occupancy of the Island is illustrated by the most complete collection of local archeology in existence. Neither the State Archeological Museum at Albany, nor the corresponding department of the American Museum of Natural History can boast of so many Indian implements from Staten Island as those gathered together in our museum. There is also an excellent collection of implements illustrating the life and culture of the Iroquois Indians of Central New York, a recent gift.

Ornithology is represented by three cases containing the resident and migrant birds of Staten Island. This is supplemented by a series of nests and eggs of the more familiar breeding birds, and by colored plates, showing the bird life from month to month as it changes. Half a case is devoted to a special educational exhibit of birds' eggs, illustrating certain well known facts, such as the relation of shape, color and size to surroundings, patterns of coloration, etc. There are also two small cases, one of tropical American and one of European birds.

The collection of insects now includes nearly 2000 specimens, although few of these are on exhibition. A special case contains the Staten Island lepidoptera, while some of the more showy tropical butterflies are shown on the wall. Certain biological factors, as variation, mimicry, etc., are illustrated with entomological examples. An exhibit entitled, "Insect Architecture," including various types of nests made by hymenopterous insects, cocoons of silk worms, etc., is of special educational interest.

The Museum possesses a very large collection of shells, but few are on exhibition, as the space they would occupy is needed for more important exhibits. The same may be said of the minerals, of which there are perhaps 2500 specimens.

The geological exhibits are of special value, as they have been carefully planned to illustrate not only the structural features and physiography of the island, but the mineral products and resources. It is in the possession of exhibits of this kind that the museum is slowly gaining ground, and attracting visitors of serious aims. The best indication of the good that is being accomplished along these lines may be found in the fact that our constant visitors are not, as might be expected, members of the Association or their friends, but are drawn from the general public;—the very class for which the Museum was established. And it seems to be a universal rule, in the experience of the officers in attendance, that whoever comes to scoff remains to praise.

Last winter the Museum undertook three courses of popular lectures for the benefit of the children. The experiment was a tentative one, but the results were so good that steps are now being taken to have these lectures made a regular feature of the winter season. The first course consisted of a series of four talks on the various divisions of the animal kingdom, illustrated by museum specimens. The next course was devoted to the general subject of winter protection and winter habits in birds, mammals, insects and plants. The final course included three lectures on the formation of rocks, on fossils, and on the early customs of the Raritan Indians.

In addition to its quarterly *Proceedings* the Association now issues monthly a one-page Museum Bulletin, containing accounts of interesting accessions and general information concerning the activities of the Association.

The city budget for the current year contains an appropriation for maintenance, and it is the hope of the officers of the Association that, as the museum expands and enlarges its sphere of influence, this appropriation may be increased to keep pace with the development. Ultimately we hope to have a building of our own, which shall house a museum proportionately as useful to Richmond Borough as are the magnificent institutions in Manhattan and Brooklyn to the people of our sister boroughs.

Dr. A. R. Crook (Illinios State Museum of Natural History, Springfield).—"I move that papers not presented when called for, shall go to the end of the program."

President Holland.—"A certain amount of discretion ought always to be allowed the presiding officers to arrange matters of program. The Chair would not like to be regarded as opposing a motion, but he would like to have it understood that the adoption of such a resolution will not prevent the exercise of discretion in individual cases."

The motion was then put to a vote and lost.

Mr. Frederic A. Lucas, of the Brooklyn Institute Museums, then demonstrated a poster prepared by the larger museums of New York City, upon the suggestion of Mr. Townsend, and displayed at various public places, for the purpose of conveying information concerning the museums of New York, what they contain, and how they can be reached. The poster was arranged by Dr. Kent of the Metropolitan Museum, and contained photographs of each institution in addition to a brief text. The poster elicited much favorable comment.

A vote of thanks to the officers of the Pennsylvania Academy of Fine Arts, for their courteous hospitality, was then adopted, and the meeting adjourned to inspect the Academy. The members were later conveyed by automobiles to the Pennsylvania Museum, in Fairmount Park, for lunch and an informal reception by the Board of Trustees and a committee of ladies. The Association was welcomed by Mr. Theodore C. Search, president of the Museum, as follows:

Mr. Theodore C. Search.—"Ladies and Gentlemen: The Pennsylvania Museum and School of Industrial Art extends its most cordial welcome and its hospitality to the visiting members of the American Association of Museums.

"The knowledge that some of you have acted as hosts on similar occasions and made others most cordially welcome at your own fireside, reminds us that 'with what measure ye mete, it shall be meted unto you,' and we trust you will recognize that we are endeavoring to live up to the scriptural injunction.

"Let us congratulate ourselves that so many are gathered to honor and to advance the common interests. Recent years in museum work have brought larger recognition and increased responsibility, and also a greater understanding by the public of the sphere of museum influence.

"Haphazard arrangement of exhibits has given way to scientific placement. Idle curiosity has been supplanted, in large measure, by genuine study. The national life is indicated by the customs of the people and national proclivities may be judged by these customs and national progress may be outlined by successive creations of handiwork and skill properly arranged by the curator. In the museums, as no-where else, we may obtain information concerning the people of the earth, their racial characteristics and proclivities, and if, as has been asserted and not denied, the proper study of mankind is man, then are our museums worthy of the most learned and scientific treatment.

"That you, in large measure, agree with this sentiment is sufficient to account for your presence on this interesting occasion and at the same time is a guarantee that these meetings will advance the general understanding of museum value, and more firmly establish their right to be more conscientiously considered, and to become the recipients of the benevolence of the various communities they represent.

"And now, a word as to our title—The Pennsylvania Museum and School of Industrial Art—which to some of you may seem somewhat complex. The great centennial movement of 1876 ushered in a period of wondrous art activity, and it pleased a number of the progressive people of our city to organize an effort to preserve many of the exhibits assembled. A charter was obtained to effect this purpose and a provision of that charter called for the maintenance of a school of art. The title sufficiently describes the kind of school intended.

"Such a school has been vigorously promoted along the lines of art and its application to industry. The museum and schools are each conducted by their own separate directors and committees, unity of interest being obtained and maintained through a common executive committee. The schools are located in the midst of our industrial activities but their inspiration is largely drawn from museum objects in all their great variety. To these schools you are all invited—any time suitable to your convenience will be agreeable to us.

"I trust your meeting may in a large way advance the welfare of the objects you all hold so dear at heart and that your stay with us may be a pleasant memory." (*Applause.*)

The afternoon was devoted to an inspection of the Pennsylvania Museum and the Zoölogical Garden, with an automobile ride through Fairmount Park.

SESSION OF TUESDAY, MAY 11

Evening

After listening to an organ recital in the main auditorium of the Drexel Institute, the evening session was called to order for the reading of papers, President Holland in the chair.

President Holland.—"Ladies and Gentlemen: Before we hear the illustrated papers of the evening, I have requested Dr. Bumpus, director of the American Museum of Natural History in New York, to present a matter in which I am sure we shall all be interested."

NEW METHODS OF MAKING RELIEF MAPS AND PLASTER CASTS

I wish to demonstrate a new method of making relief maps, which has been developed at the American Museum of Natural History under the necessity of turning out a number of maps on short notice. In making relief maps, the finished product is often somewhat disappointing. As you know, it is necessary to have a strictly horizontal surface, and the coloring of the water line with the brush is sometimes difficult to accomplish so as to produce an absolutely horizontal plane. We have obviated this difficulty in the following way: We first modeled the portions in relief on a sheet of glass. A metal mould was then taken from the model and inverted, so that all the elevations appeared as depressions, into which we packed plaster mixed with coloring matter. The surface was then carefully smoothed off, and a sheet of plaster of another color was then poured over the whole, producing a relief map all colored. No brush has touched this map, and if you pick away the mountains you will find them the same color all through. The water line is absolutely horizontal, and it is possible for a man to turn out half a dozen complete copies of this map in a day.

While discussing the use of plaster, I may also mention our experience in making a number of human figures of life size. We have found these rather expensive in the past. It is often necessary to pay more for a plaster man than a good many men are worth. We recently needed a number of these on short notice, and found the price of the average modeler exorbitant. We engaged a negro model and arranged a little room over a radiator, so that it could be made very warm. It was a charming climate for that gentleman; who, for a trifling consideration was willing to sacrifice his time for science. In that room we could use a paraffine spray of low fusing point, and so spray the model all over with paraffine. In that warm room the paraffine would bend, so that it made no difference if the model moved a little. When the model had been coated with paraffine, two or three attendants quickly covered him with plaster from head to foot, and by this method we were able to make six or eight life-size models in a single day with very little trouble.

In removing the plaster from the model, the usual draw strings are used, and the paraffine coating comes off with the plaster mould, from which it is easily removed, leaving the details of the skin clearly shown. A figure made by this method costs not over $10 without coloring.

The following paper by Mr. C. T. Brues, of the Milwaukee Public Museum,[1] was then read by title:

THE INSECT PESTS OF MUSEUMS

Everyone engaged in the study, care, or arrangement of museum specimens of organic origin has at some time become painfully aware of the presence of museum pests. It may be first one, then another, but even in the best kept and most carefully guarded collections, the sporadic occurrence of varied insect pests is almost inevitable and it requires eternal vigilance to prevent them from obtaining a foothold so secure that they can be with difficulty exterminated. Collections once absolutely cleared from pests are subsequently besieged on all sides by stray specimens or by others brought in through the acquisition of fresh material already infested.

The present short consideration is intended to give a brief recognizable description of the more regular and important insect pests of museums together with such points concerning their life history and control as may be useful to the museum curator when he meets them in the course of his work. Between 15 and 20 species are included, and I believe that no generally abundant pest has been omitted, with the exception of some of the moths and beetles which infest such stored grain and cereal products as are often included in museum exhibits of a commercial rather than purely scientific nature. Indeed one could easily single out less than half a dozen species which cause nearly all of the actual damage to museum specimens in this country.

Many of the species have been associated with man from early antiquity and have thus through commerce become nearly cosmopolitan. Others of less wide distribution are continually being scattered broadcast, so that, except as affected by great extremes of temperature, the museum pest problem is destined to become more and more similar throughout the entire world.

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[1] Now of the Bussey Institution, Harvard University.

The precautions against the introduction of insect pests into museums have no doubt become so familiar to all members of the Association through experience that a summary of them here may possibly seem out of place. Fumigation of current accessions with carbon bisulphide or hydrocyanic acid gas is advisable and, of course, poisoning by arsenic, when possible, should follow. The latter substance has the advantage of offering permanent protection from future injury, while the preliminary fumigation will usually destroy all the pests present at that time. When possible, however, it should be followed by a period of quarantine in a warm place to detect the development of any insects not killed by the treatment, for if a fumigated and even poisoned specimen be introduced among older, unprotected specimens the insects will almost invariably migrate to them and start a colony or point of infestation which may rapidly spread. In fumigating, it is well to remember that the vapor of carbon bisulphide is heavier than air and will consequently penetrate best in a downward direction, while that of hydrocyanic acid is lighter than air, causing it to penetrate more rapidly upward. The use of white arsenic in some form of suspension or solution is preferable to that of corrosive sublimate since the latter is fugitive, gradually subliming and disappearing even at ordinary temperatures. Arsenic, however, as far as I am aware, is to all practical purposes as permanent as the specimens themselves, and on this account more suitable than any other poison in general use.

Practically all materials of organic composition are liable to damage by insect pests, although of course some classes of objects are especially susceptible to attack. The integument of animals in various forms, such as hair, wool, feathers, furs, skins, etc., and dried pinned insects usually require the greatest care, while objects of plant origin such as herbarium specimens are comparatively safe with but few precautions. Notable exceptions, however, are seeds and commercial starchy products, etc., which are very susceptible; even Cayenne pepper is one of the favorite foods of the cigarette beetle (*Lasioderma serricorne*).

GENERAL REMEDIES

The problem of readily exterminating colonies of insect pests once established in exhibit or storage cases, is one which often confronts us, and which sometimes presents great difficulties. However, as members of the Association already know, this matter has been advanced far toward a satisfactory solution by Mr. Chas. R. Toothaker, who has applied to museum work the methods of fumigation by means of hydrocyanic acid gas which have been shown by economic entomologists to have such a wide field of usefulness in various lines. The use of this gas is probably the most satisfactory and absolutely sure method yet devised, and, when applicable, has, I believe, everything to commend it.

Besides this, there are various other general methods of protection which are worthy of notice. Carbon bisulphide, as already mentioned, is often very suitable for fumigation, especially for small cases or drawers. It has the advantage of being non-poisonous to persons using it, and is very powerful in its effects on insect life. It has great penetrating power when applied or allowed to evaporate from above, but is of course extremely inflammable and explosive when in vapor form, being as easily ignited by a lighted pipe or cigar as by direct flame.

The use of naphthaline, preferably in resublimed form, is effective as a repellant for insect pests of all sorts, and when continually kept in small quantities among collections not hermetically closed is practically trustworthy in preventing the entrance of pests, to all of which its odor seems to be extremely distasteful. It is important to secure a good grade of properly sublimed naphthaline as much of the commercial product, for example, "moth-balls," usually contains a quite considerable amount of some hydrocarbon grease which, being left in cases after the slow sublimation of the naphthaline, will be absorbed by the wood, paper, or specimens with which it is in contact, thus doing almost irreparable damage. In practice, we have found in our own museum, that, in protecting our insect boxes, we cannot rely on purchased naphthaline cones for this reason, and have been compelled to prepare our own by casting the melted flake naphthaline in clay molds of appropriate size and form. Thus prepared, the cones may be left in the boxes until completely gone without fear of greasing the boxes. The presence of naphthaline tends to prevent the growth of insect larvæ, and although it is not probable that the amounts ordinarily used will normally kill the pests, it has the undoubted effect of slowing down or inhibiting their development as long as it remains. The use of creosote has been advised for the protection of insect cases by Dr. George W. Bock. He uses inverted thimbles containing a tuft of cotton saturated with creosote, attaching the thimble to the bottom of the box by means of a short pin soldered to the convex tip of the thimble.[1] This is said to be more satisfactory than naphthaline and more easily replenished, while the receptacles have the advantage of being light and less easily displaced by jarring.

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[1] Mr. W. P. Comstock has still more recently advocated the use of gelatine capsules, with the cap removed, and impaled on a pin, for holding the cotton containing the creosote.

In some special cases, as mentioned later, powdered pyrethrum or "Persian insect powder" is useful in destroying pests. This substance kills by contact and not through the alimentary tract, and must be fresh and in good condition for it weakens greatly with age and exposure to the atmosphere.

This short list probably includes all the remedies of general application, although, as will be seen from a reading of the second part of the present account, there are a few species against which special methods of procedure may be adopted.

The figures used as illustrations have been in great part obtained through the courtesy of Dr. L. O. Howard, chief of the bureau of entomology, who has loaned them for this purpose from the fine series of published drawings belonging to that department.

SPECIAL PART

Order Thysanura

The Silver Fish (*Lepisma saccharina* Linn.)

This is a very active wingless, worm-like insect of very primitive organization. It measures about 8 mm. or less in length, although it often appears much larger on account of its long antennæ and the three long anal filaments which nearly equal the body in length. The body is flattened below, convex above and tapers posteriorly. It is thickly clothed above with appressed, pale, shining, silvery scales which give to it a bright, glistening appearance. When in motion it darts rapidly about, much after the manner of a small cockroach.

The food of the silver fish consists of paste, dextrin, sugar, glue, paper sizing, etc., and the insects have the habit of gnawing over the surface of all sorts of objects in the preparation of which these substances have been used, thus marring their finish. Books and photographic prints are especially subject to their attacks. The former may have the lettering, leather, or paper removed from the bindings by the insects in their search for the paste or glue by which they are attached. In a similar way, pasted labels, photographic prints, etc., may be gnawed through in spots of irregular size and outline. The species shuns the light and does most of its damage in libraries where books are stored away on dark or seldom used shelves. Its presence is easily noticed if it is abundant by an occasional scurrying individual which has been exposed to the light by the sudden removal of a volume.

The insect succumbs very readily to pyrethrum or it may be easily baited by soaking pieces of blotting paper in a thick starch paste to which a small amount of white arsenic has been added. This placed where they can find it will usually attract and poison them. In cases where this does not prove satisfactory, the addition of a small amount of glue will make it more effective.

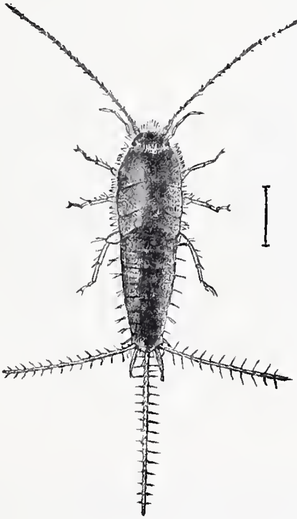

Fig. 1. *Lepisma saccharina* Linn. After Marlatt. Courtesy of the U. S. Bureau of Entomology.

Order Corrodentia

The Book Louse (*Troctes divinatoria* Müll.)

This little insect is probably the most diminutive museum pest with which we have to deal. It is a delicate, much flattened creature, scarcely a millimeter in length, almost a transparent pale yellow in color, with oval wingless body. Ordinarily it is most abundant on old volumes that are seldom used, but in museums it is very frequently seen hurrying about in insect boxes, especially those containing freshly pinned material. It is said to breed most rapidly in materials like straw, but probably

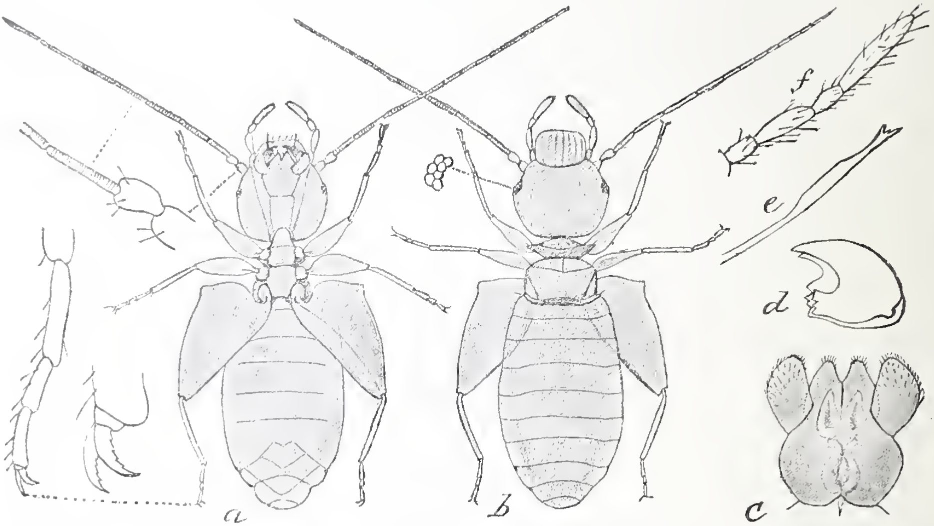

Fig. 2. *Troctes divinatoria* Fabr. *a*, adult from below; *b*, same from above; *c*, labium. *f*, maxillary palpus; *d*, mandible; After Marlatt. Courtesy of the U. S. Bureau of Entomology.

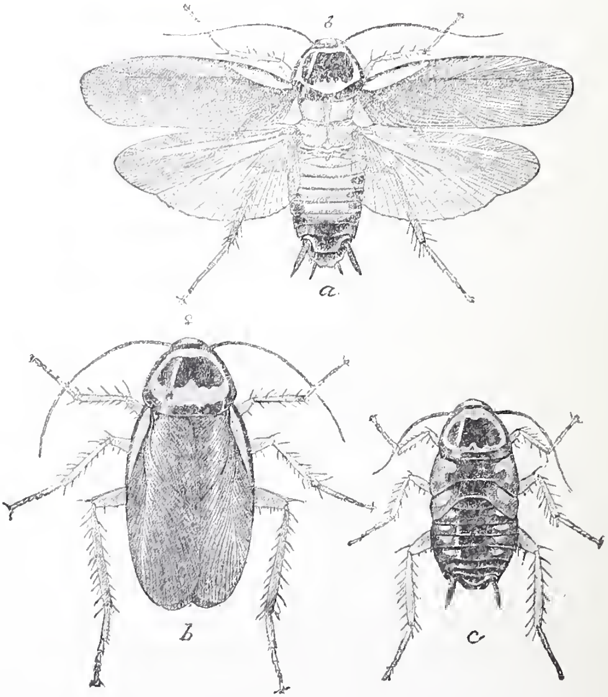

Fig. 3. *Periplaneta australasiæ* Linn. *a*, male with spread wings; *b*, female; *c*, nymph. Natural size. After Marlatt. Courtesy of the U. S. Bureau of Entomology.

never occurs in sufficient abundance in museums to cause actual annoyance or damage.

It is very susceptible to the effects of pyrethrum and easily kept out of insect boxes by the usual nathphaline or creosote.

Order Orthoptera

Cockroaches (*Periplaneta*, etc.)

Although the several common species of cockroaches which regularly frequent houses in the United States can hardly be classed as museum pests, they quite often appear in museum storerooms where they may do considerable damage.

The injury which they cause is due to gnawing on the surface of objects, such as bound books, to obtain the paste beneath, of which they are very fond. When their taste for starchy food cannot be satisfied, they may become practically omnivorous and damage articles of all sorts by rasping off patches of the surface covering. Fresh insects when placed to dry on setting boards are especially subject to their attacks.

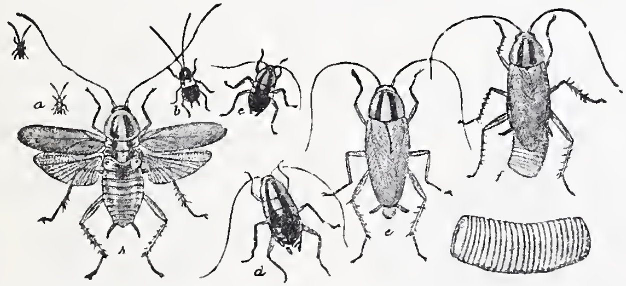

Fig. 6. *Blatella germanica* Linn. *a*, first stage; *b*, second stage; *c*, third stage; *d*, fourth stage; *e*, adult; *f*, adult female with egg case; *h*, adult with wings spread. After Riley. Courtesy of the U. S. Bureau of Entomology.

Order Isoptera

The Northern Termite (*Termes flavipes* Koll.)

The present species is the only one which occurs abundantly in most parts of the United States, and the one which causes nearly all of the damage in our country. Southward and into the tropics the number of species increases rapidly and they become extremely injurious to wood work of all sorts.

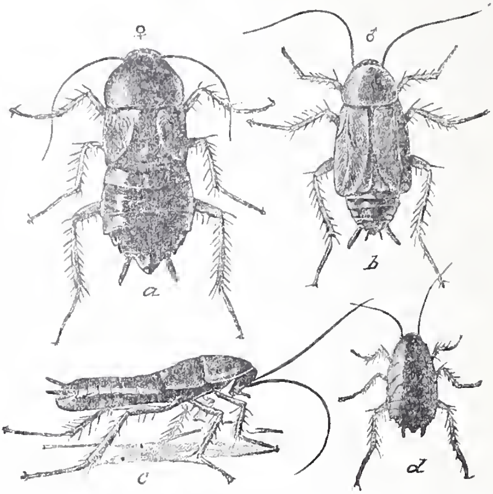

Fig. 4. *Periplaneta orientalis* Linn. *a*, female; *b*, male; *c*, side view of female; *d*, half-grown specimen. After Marlatt. Courtesy of the U. S. Bureau of Entomology.

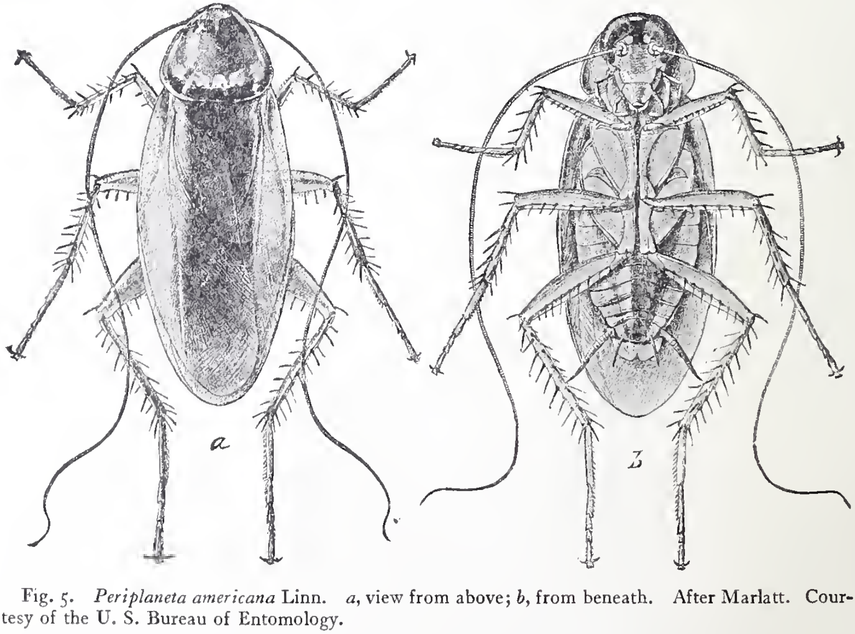

Fig. 5. *Periplaneta americana* Linn. *a*, view from above; *b*, from beneath. After Marlatt. Courtesy of the U. S. Bureau of Entomology.

Termes flavipes feeds upon wood which is at least somewhat moist or surrounded by a damp atmosphere, and when introduced into museums or other buildings sometimes undermines the supports of floors to such an extent as to threaten or cause their collapse. Marlatt notes the following concerning the occurrence of this pest in Washington: "The flooring of one of the largest sections of the United States National Museum was for some years annually undermined and weakened by a very large colony of these pests which could not be located, and finally the authorities solved the problem by replacing the wood floor with one of cement." Here then is another advantage of fire-proof construction for museums.

Besides wood, this species destroys books or stored papers if these are kept in rooms which are at all moist and not frequently examined. In such cases its work is apt to pass unnoticed as the termites mine directly through the mass of wood or papers, not breaking through the surface in such a way as to indicate their presence. Records of injury to books are very common, especially in the warmer parts of the country, where most of the damage to woodwork occurs.

The termites live in colonies and each community contains at least three forms, the sexual insects and the workers, which last comprise the great bulk of the colony, except when the winged sexual forms are produced in great quantities at the time of swarming. The issuance of the sexual forms is the most noticeable evidence of the presence of the insects. These are about 6 or 7 mm. in length, shining black, with four large, similar, closely netted-veined, glistening white wings. The entire swarm appears at once, even a small colony producing a large number of adults. The workers and immature males and females are almost pure white, except for yellowish or brownish color on the head. They never venture into the light unless their nest is disturbed or broken into.

If care is taken never to introduce any infested material, they ought to be very easily kept out of museums, at least in our own region. When present, the point of emergence of the swarm of adults will give a clue to the location of the colony.

Order Lepidoptera

The Clothes Moths

Several species of small moths belonging to the same general group of Tineoid Lepidoptera may be included under this head, as at least two of them have been very frequently confused.

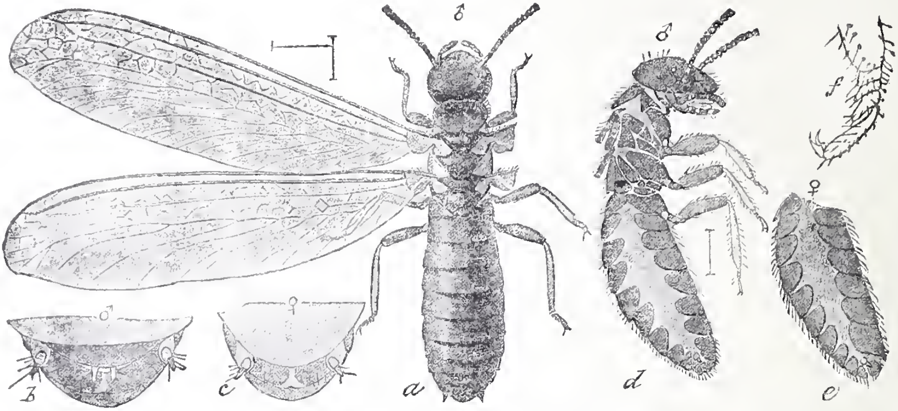

Fig. 7. *Termes flavipes* Koll. *a*, adult male; *b*, terminal abdominal segments of same from below; *c*, same of female; *d*, male, side view; *e*, same of female; *f*, tarsus. After Marlatt. Courtesy of the U. S. Bureau of Entomology.

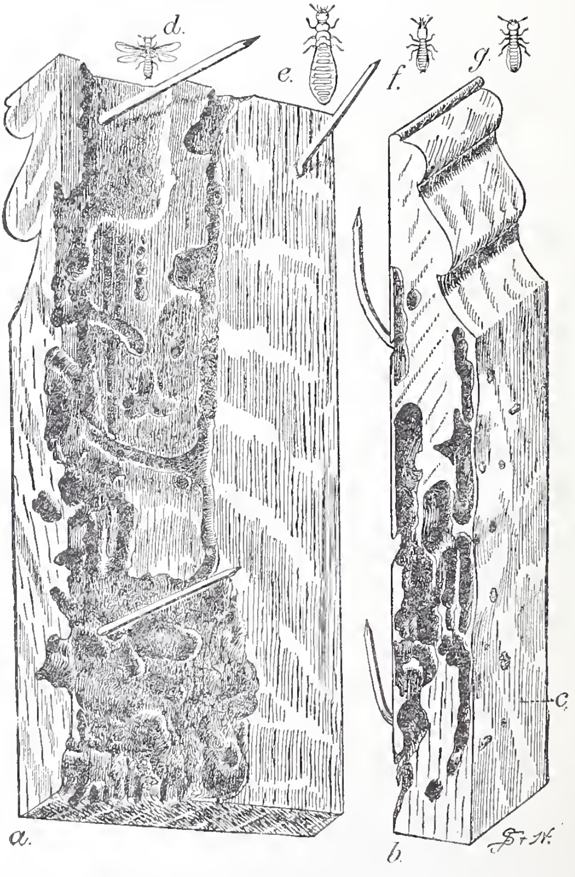

Fig. 8. Work of *Termes flavipes* in sound and dry red oak molding from door casing. *a*, inner portion; *b*, longitudinal section; *c*, outer surface; *d*, male; *e*, female; *f*, soldier; *g*, worker, natural size. After Hopkins. Courtesy of the U. S. Bureau of Entomology.

The Case-making Clothes Moth (*Tinea pellionella L.*)

The adult moth measures from 10 to 14 mm. across the wings and is about 5 mm. in length. The head and forewings are grayish yellow, with indistinct fuscous spots on the middle of the wings; the hind pair are whitish or grayish and silky, provided with a dense fringe of long pale hairs. The larva is dirty white in color, with the head and upper part of the following segment light brown. It is less than 10 mm. in length, cylindrical in form and never leaves the case which it constructs about its body. This case consists of a matted mass of small particles of the wool or other substance upon which it is feeding, lined interiorly with a coating of soft whitish silk. Whenever the larva wishes to change its location, the anterior part of the body is thrust out of the case which is dragged about by its inmate. Pupation occurs within the case which is attached to the substratum by means of a loosely woven series of silken threads. The moths usually appear in the early or middle summer months, depositing their eggs soon after emergence, and dying shortly afterward. In the north the larvæ are very rarely present during the winter, although one can never be positive that damage will not occur during winter months in heated buildings. In the south, however, two or even more broods may occur.

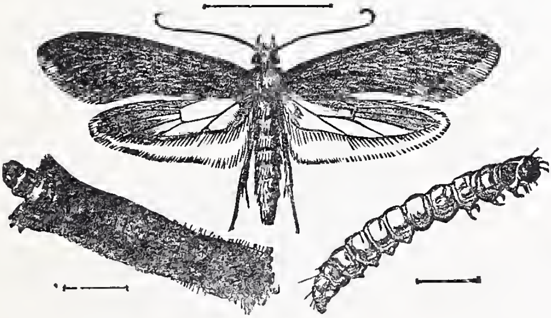

Fig. 9. *Tinea pellionella* Linn. Adult, larva, and larva in case. After Riley. Courtesy of the U. S. Bureau of Entomology.

The principal damage caused by the moth in museums is confined to anthropological specimens composed of wool or feathers, tapestries, etc., although it also affects furs of all sorts.

The presence of the larvæ can be most easily recognized by the occurrence of the cases, aside from the presence of patches of matted silken threads. The flying moths are easily noticed in cases on account of their light color and rapid erratic flight.

The Southern Clothes Moth

(*Tineola biselliella* Hummel)

The habits of this species are very much like those of the previous one, but their distribution is not coextensive, the present form, as its name indicates, being more characteristic of the southern half of the country. From the latitude of Washington southward it is the predominant species, and although occurring also in the northern tier of states, it is there much less abundant than *T. pellionella*.

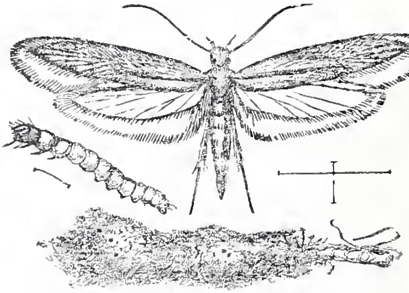

Fig. 10. *Tineola biselliella* Hummel. Moth, larva, and cocoon with empty pupa-skin. After Riley. Courtesy of the U. S. Bureau of Entomology.

The two are of approximately the same size but in *biselliella* the wings are uniformly pale ochreous, without the darker spots or markings present in *pellionella*. The larvæ of both forms are quite similar, but this species does not construct any regular case, simply spinning a fine silky or cobwebby path as it migrates in feeding. Its presence is thus easily made out by the grayish streaks mixed with the granular excrement of the caterpillar. On attaining full growth, the larva prepares a cocoon of bits of its food woven together with silk like that of *pellionella*, except that it is usually more irregular in outline. Animal matter of many sorts is attacked by the larvæ, more particularly woolen, hair, feather, and fur objects. Their occurrence on any sort of plant matter is doubtful. According to Marlatt, this species passes through two annual broods even in the North, the larvæ of the first brood appearing in June from eggs deposited in May and those of the second brood later in the summer, during August and September.

The Tapestry Moth (*Tricophaga tapetzella* Linn.)

This is much larger than the two previously mentioned clothes moths and of rather rare occurrence in museums. The wings expand about 15 mm., the fore pair with their basal third black, the apical two-thirds creamy white, more or less obscured near the middle with gray. The hind pair are pale gray.

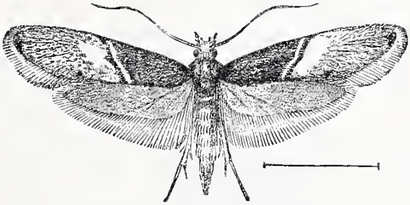

Fig. 11. *Trichophaga tapetzella* Linn. After Riley. Courtesy of the U. S. Bureau of Entomology.

It usually infests heavier and coarser materials than the two former species, and is occasionally found on skins or furs.

Order Coleoptera

Family Dermestidæ

This family includes a number of the most destructive of all museum pests. These ordinarily injure only matter of animal origin, but several are also known to feed to a considerable extent on dried plants, cereal products, etc. With the exception of the various clothes moths, they form by far the most important group of museum pests.

All are of small size, never over 10 mm. and usually not more than 4 mm. in length. The form of the body is elongate oval, without projections of any sort, and dark or marmorate in color, generally thickly pubescent or scaly, at least below. The larvæ are elongate, fleshy, usually somewhat cylindrical in form and tapering behind, clothed with numerous long, erect, curved hairs. Their presence can be most easily detected by the small spots or piles of their dry, finely granular excrement which accumulate beneath infested specimens. Another evidence of their presence is the occurrence of the dried skins shed by the larvæ at each molt. As every larva molts five or six times, these cast skins are always in evidence where the insects are feeding. While still retaining the external form and hairy form of the larvæ, they are extremely thin and light and are readily blown about by the slightest air currents. Although the skins are usually about the specimens in plain view, the feeding larvæ are generally well hidden from view, and are not ordinarily seen unless the specimens are carefully examined or shaken with this object in view. On this account one must usually depend upon the cast skins and powdery excrement to detect their presence.

Dermestes

The several species of this genus which appear in the rôle of museum pests are the largest members of the family and usually prefer skins, bones not well cleaned, or other substances containing rather large quantities of dried animal matter. This is to be expected as in nature most of the species breed in dried carrion which has passed through the earlier stages of decomposition and decay.

The Larder Beetle (*Dermestes lardarius* Linn.)

The majority of the Dermestid larvæ occurring on dried bones, animal skins, and other materials with much unremoved animal matter, belong to this species. The larva is a dirty brown, with more or less distinct pale cross bands at the sutures between the segments. Its body is rather elongate, cylindrical, and quite distinctly narrowed toward each end. The surface is well covered with long bristly hairs which are better developed toward the posterior end of the body which bears above two short, curved, horny spines. The adult is elongate oval, with nearly parallel sides, and varies in length from 7 to 8.5 mm.; it is entirely black, except for a brownish-gray, often reddish or yellowish band near the base of the elytra, marked on each side of the median line by a group of three closely placed black dots.

This species occurs both throughout the United States and Eurasia, and is probably native to both continents, although of course now widespread by commerce. It breeds very rapidly and, according to Chittenden, can complete its entire life cycle within the brief space of six weeks, five of which are spent in the larval stage. At this rate it might very easily pass through four or five generations annually in well-heated and otherwise congenial surroundings.

The late Dr. Hagen of the Museum of Comparative Zoölogy writes of successfully trapping the adults in large numbers by means of cheese used as a bait. They are very fond of this and will be attracted to it in large numbers. While methods of this sort may ameliorate conditions in very badly infested places, they cannot of course be relied upon to exterminate such a persistent pest, once it has established itself, and recourse must be had to more certain methods.

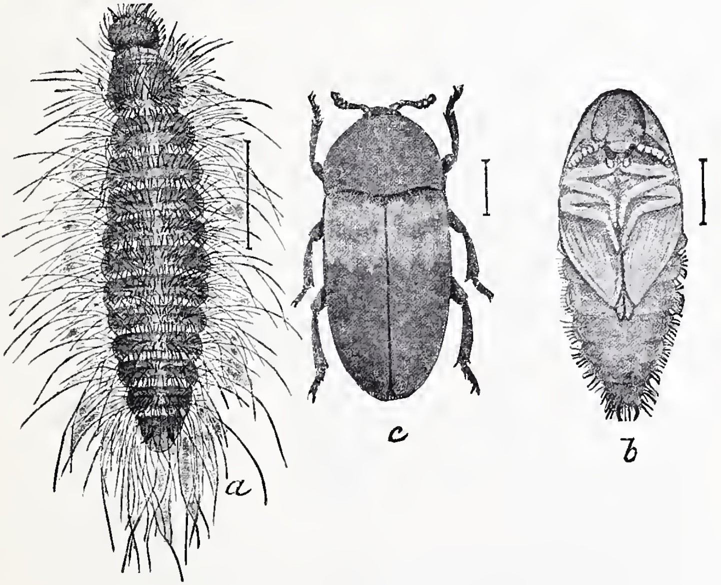

Fig. 12. *Dermestes lardarius* Linn. *a*, larva; *b*, pupa; *c*, adult beetle. After Howard. Courtesy of the U. S. Bureau of Entomology.

Other species of *Dermestes* are known to breed in museums as before mentioned, but much less commonly than the present one. All are very much alike in the larval stages, but the adults of the other species are usually black, marmorate with white or buff above, and principally white below. They are of about the same size or somewhat larger.

The Black Carpet Beetle (*Attagenus piceus* Oliv.)

In some localities this is more abundant than the species of *Anthrenus* mentioned on a later page, and is perhaps more destructive to pinned insects than any other pest. The beetle is very small, varying from 3¼ to 4½ mm. in length; narrowly oval in shape, a little more than twice as long as broad. In color it is very dark brown, nearly black, although some specimens, particularly those newly emerged, often have quite a brownish or reddish cast. The surface of the body is quite distinctly shining and thinly clothed with very short pile. The antennæ are clavate in both sexes, the last club joint considerably elongated in the male. It is quite probably introduced from Eurasia, where it is widely distributed, but has been known in the United States since the early fifties, and occurs throughout the entire eastern part of the country. The larvæ are more elongate than those of *Anthrenus* and are more similar to those of *Dermestes* from which they differ by the longer tuft of hairs at the posterior end of the abdomen. The body is elongate, somewhat cylindrical and gradually narrowed behind, with the surface clothed with short appressed hairs. It is light brown in color, with the sutures between the segments pale. When disturbed it will usually feign death, although its movements are ordinarily quite active. As with other members of the family which infest insect collections, it is probable that the young larvæ quite often gain access to cases of specimens after hatching from eggs laid outside, although the females will of course enter, if possible, to oviposit. This species requires an unusually long time to complete its metamorphosis; according to Chittenden two years are required for the life-cycle, only one or two weeks of which are spent in the pupal stage.

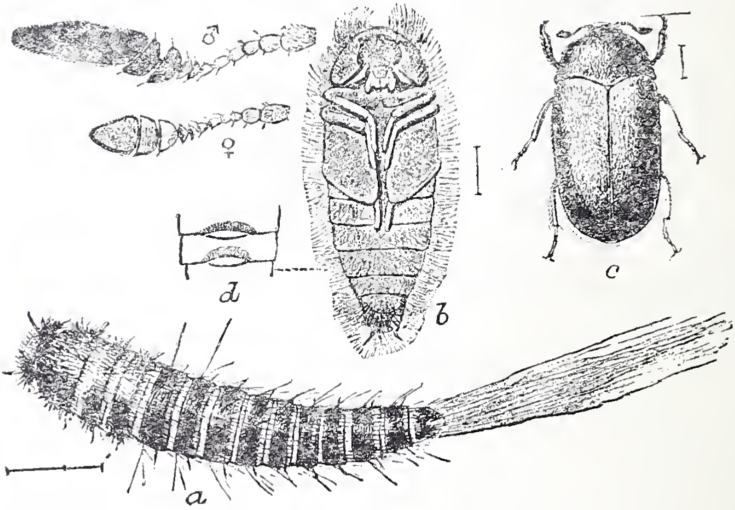

Fig. 13. *Attagenus piceus* Oliv. *a*, larva; *b*, pupa; *c*, adult; *d*, dorsal abdominal segments of pupa; above at left, male and female antennæ. After Howard. Courtesy of the U. S. Bureau of Entomology.

Aside from destroying pinned insects, this species also infests most other dried matter of animal origin, including, wool, feather objects, etc.

The Carpet Beetle (*Anthrenus scrophulariæ* Linn.)

The present beetle is a native of Europe which appeared in New York and Boston in 1874. It has since spread throughout the New England, Central and Western states and often appears as a museum pest. Besides attacking skins, it regularly feeds on carpets and woolen goods of all sorts, so may be expected to infest materials of this nature in museums.

The adult beetle is 3-3.5 mm. in length, of oval shape; black above, with the sides of the prothorax and three transverse irregularly angled bands on the elytra, white. The elytra along the suture are clothed with reddish, rarely yellow or white scales; antennæ 11-jointed, with a 3-jointed club. The larva is elongate oval, 6 mm. or less in length, and clothed with stiff brown hairs which are longer along the sides and still longer at the ends.

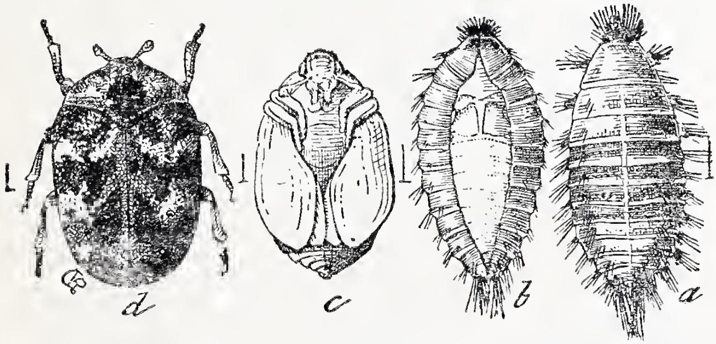

Fig. 14. *Anthrenus scrophulariæ* Linn. *a*, larva, dorsal view; *b*, pupa within larval skin; *c*, pupa, ventral view; *d*, adult. After Riley. Courtesy of the U. S. Bureau of Entomology.

The adults usually appear in the fall, but may continue to issue during the winter and spring. Soon after emergence the females deposit their eggs which hatch after a period of only a few days. There are about six larval instars, generally of short duration, although these may be prolonged almost indefinitely from lack of food, low temperature, or other untoward conditions. The species appears to pass normally through two generations each year. Although still of somewhat sporadic occurrence, it appears to be growing steadily more abundant and widespread.

The Cabinet Beetle (*Anthrenus verbasci* Linn.)

This species probably causes nearly as much damage to collections of pinned insects in this country as any other single pest. It is common to both North America and Europe, but its destructiveness to museums abroad appears to be much less than with us, the related *A. musæorum* Linn. there assuming the more important rôle.

The beetle is about 2-3 mm. in length, of rather regularly oval form, with black ground color and scaled surface. The elytra bear three irregularly bulging transverse bands, and the prothorax anteriorly to the scutellum has a median white spot. The under side is whitish or yellowish, while the upper side is furnished with yellowish brown scales, the scales elongate, three or four times as long as broad. Antennæ 11-jointed with a 3-jointed club. The larva is very similar to that of the preceding species.

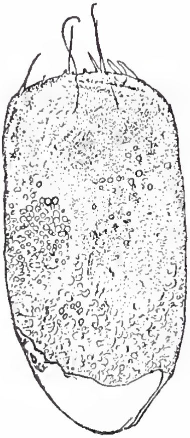

Fig. 15. *Anthrenus verbasci* Linn. Egg. After Viereck. Courtesy of the U. S. Bureau of Entomology.

As naphthalin is the material regularly used to protect museum specimens of insects from pests, the following observation of Mr. H. L. Viereck is of special interest, particularly as it will most likely be found to apply equally well to other Dermestidæ. "Eggs were first noticed about March 1. On March 15, four eggs were put on a piece of cloth, which was pinned into a Schmitt box with no insecticide in it; another lot of four eggs was put on a piece of cloth and pinned into a box containing three naphthalin cones. April 7 the eggs in the box without naphthalin had hatched and the larvæ were lively. In the box with the naphthalin two eggs had matured embryos or young larvæ; one larva had eaten the end off the egg preparatory to emerging, but there died; the other did not succeed in cutting through the cover, though it was apparently as far advanced in development as the first specimen. The second embryo had apparently inhaled the fumes of the naphthalin through the thin membrane of the micropyle." In other cases it has been found that naphthalin does not kill the emerging larvæ, but only inhibits or retards development while its fumes are present in the insect boxes. This is apparently the case with the smaller amounts of naphthalin generally used.

The Museum Beetle (*Anthrenus musaëorum* Linn.)

This is very similar to the two preceding and is an extremely abundant pest in European museums. In our country, it is, so far, of much rarer occurrence. The beetles are about the size of *A. verbasci* (2–2.5 mm.), with the upper surface speckled with yellow. They may be distinguished from both of the foregoing by having only eight joints to the antennæ, which bear a 2-jointed club.

Slosson's Cabinet Beetle (*Thelydrias contractus* Mots. =*Ignotus ænigmaticus* Slosson)

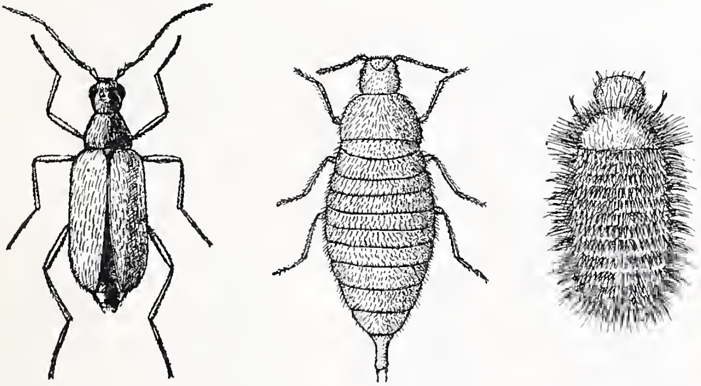

FIG. 16 *Thelydrias contractus* Mots. Male, female and larva.

This most peculiar little Dermestid, probably introduced into America from Transcaucasia, does not appear to have become anywhere abundant, but as it is an undoubted museum pest, deserves brief mention.

The beetles are brownish yellow, very small, 2–3 mm. in length, wingless in both sexes, with elytra in the male, but entirely without them in the female which is larviform. The male is slender, with contracted head and prothorax; while the female is quite stout. Both have a single ocellus on the vertex of the head. The larva is short and stout, thickly hairy, especially on the abdomen, with well-developed head and prothoracic segment.

It will probably be found to infest all sorts of dried animal matter, having already been found in this country on dried insects and echinoderms.

Family Ptinidæ

The Spider Beetles (*Ptinus fur* Linn.; *Ptinus brunneus* Duft.)

These two species are quite similar in form and appearance, the former being distinguished by a series of four white bands on the elytra. The body is somewhat globular, especially in the female, with long and slender legs and antennæ, which give the beetle a spider-like appearance. Except for the markings mentioned, the beetles are reddish brown in color, thickly hairy below and on the legs. The larva is similar to that of *Lasioderma* described on a later page, except that the body is not so thickly hairy.

The beetles affect materials of both animal and vegetable origin, including skins, woolen cloth, roots, herbarium specimens, etc., but rarely become abundant except in the damp atmosphere of basements and cellars.

The Drug-store Beetle (*Sitodrepa panicea* Linn.)

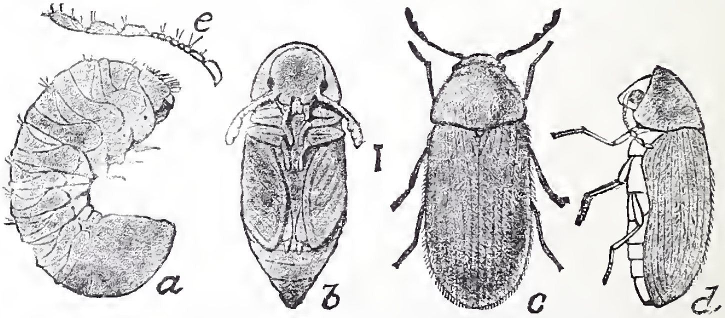

Fig. 17. *Sitodrepa panicea* Linn. *a*, larva; *b*, pupa; *c*, beetle, dorsal view; *d*, lateral view; *e*, antenna. After Chittenden. Courtesy of the U. S. Bureau, of Entomology.

This little beetle is injurious almost exclusively to dried vegetable materials, but will attack practically anything of this nature to which it gains access. Its injury in museums is restricted therefore to various sorts of botanical specimens, more especially seeds, roots, commercial products, etc., and even to wood carvings. Cases of injury to leather articles and skeletal ligaments are also on record.

The adult beetle is from 2 to 3 mm. in length, of oval cylindrical form, with the head deeply imbedded in the thorax. It is light reddish brown in color, clothed with a very fine whitish pubescence. The elytra are furnished with rows of punctures between which the surface is finely roughened. The antennæ end in a long three-jointed club. The larva is white, with dark mouth parts, and rests in the characteristic curved position shown in the figure. The injury is caused by the tunnels of the larvæ which extend in all directions through the specimens affected. Their presence is most easily recognized by the accumulations of dry powdery excrement which appear near the burrows. The species multiplies very rapidly as only two months are required for it to complete its life-cycle in a well-heated building.

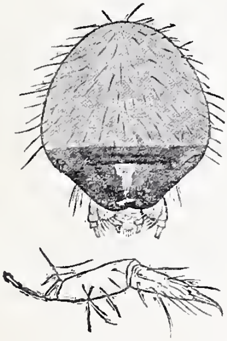

Fig. 19. *Sitodrepa panicea* Linn. Head and leg of larva. After Chittenden. Courtesy of the U. S. Bureau of Entomology.

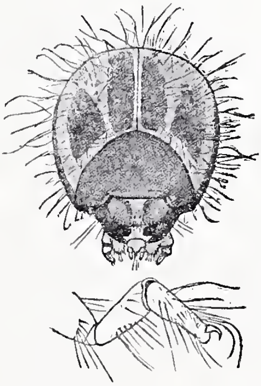

Fig. 20. *Lasioderma serricorne* Fabr. Head and leg of larva. After Chittenden. Courtesy of U. S. Bureau of Entomology.

The Cigarette Beetle (*Lasioderma serricorne* Fabr.)

The range of injury of this species is nearly coextensive with that of the last, although according to Chittenden it appears to be more abundant in herbaria. Its common name has been derived from the large amount of damage which it does to stored tobacco products.

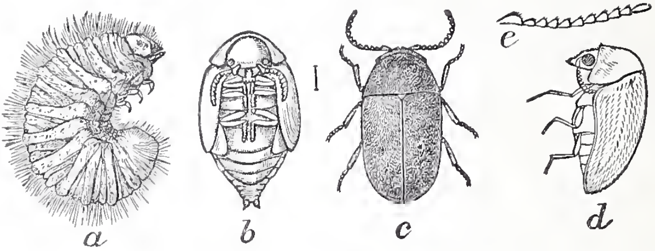

Fig. 18. *Lasioderma serricorne* Fabr. *a*, larva; *b*, pupa; *c*, beetle; *d*, same, lateral view; *e*, antenna. After Chittenden. Courtesy of the U. S. Bureau of Entomology.

In size and general form it resembles *Sitodrepa panicea*, but is broader; the antennæ are not clavate, and the elytra are not striated. The larvæ are much more thickly hairy.

Mr. Roy W. Miner, assistant curator of invertebrate zoölogy at the American Museum of Natural History, gave an informal talk illustrated with lantern slides on "Invertebrate Models and Exhibition Groups." The views thrown on the screen were photographs from models and groups of typical invertebrates and were prepared in the American Museum by Dr. B. E. Dahlgren and others. By comparing these views with those of specimens preserved in fluid, the various advantages of the model in an exhibit of invertebrates were shown. Attention was called to a new glass model of a Radiolarian, *Auloceros elegans* Häckel, placed temporarily on exhibition at the Philadelphia Museums during the time of the convention.

Miss Anna B. Gallup of the Children's Museum, Brooklyn, gave a short illustrated account of "The Children's Museum, its Methods of Work and its Results."

Mr. Adolphe B. Covert, of the University of Cincinnati Museum, Cincinnati, read an illustrated paper on "Use of Unkerheimer's Solution for the Preservation of Natural Foliage."

The final paper of the evening was given by Dr. C. H. Eigenmann, of the University of Indiana, on "The British Guiana Expedition of Indiana University and the Carnegie Museum." This paper was illustrated with lantern slides.

On the motion of Dr. W. P. Wilson, a vote of thanks to the officers of the Drexel Institute, for their hospitality, was unanimously adopted.

The Association then adjourned to meet at the Philadelphia Museums the following morning.

SESSION OF WEDNESDAY, MAY 12

Morning

The convention reassembled at the Philadelphia Museums, Mr. Wm. M. R. French in the chair.

Mr. French.—"I do not think I am to preside at this session. We had intended to hold a little meeting of the art section, if I may so call it, but we are fairly submerged. I can count only three representatives of art institutions in the assembly at this moment. My idea in advocating a separate meeting of the representatives of art museums was to transact certain business and so interest that small section of this association as to make sure of their support. I suppose we number not more than one-twentieth, perhaps, of the Association, and we have been recognized far more than our deserts so far."

President Holland here resumed the chair.

President Holland.—"I am in favor of granting the largest liberty to our art friends. If they wish to form a section of our organization they should have an opportunity for doing so. There may be technical subjects they wish to discuss among themselves, why not?

"In this connection I have had the matter of the medical museums brought to my attention. Mr. Rathmann represented this Association at the Medical Museum Association in Washington and made a plea for union with us. They said, however, that their work was of such a special and specific character, that, for the time being at least, nothing more than cordial relations could be sought; that integral association with us, as a section of our society, would be better taken up at some future time.

"In union is strength, and America is cursed to-day with quite too many societies. We are carrying the thing in the direction of disintegration and Mr. French is right. He has stood nobly for the broader view, and I feel that we are indebted to the art museums for the way in which they have aided in the larger and broader movement. Give them the right of holding sectional meetings. Let them get together and discuss what they will, just as we ask for the same privilege. Mr. French says he stands for union because he believes it stands for strength. This is a movement that ought to take in every museum throughout the land, whether of art, science or history."

Dr. H. C. Bumpus, director of the American Museum of Natural History, here demonstrated an improved metal-frame exhibition case.

Mr. C. H. Townsend, director of the New York Aquarium, then gave a talk and demonstration of transparent labels for use in aquaria.

The following paper was then read by Mr. Frank Collins Baker, curator of the Chicago Academy of Sciences:

SUGGESTIONS FOR AN EDUCATIONAL EXHIBIT OF MOLLUSKS

A visit to any of our large museums will at once reveal the fact to the average man that the usual exhibition of mollusks is given but little attention by the majority of museum visitors. The endless array of similar looking shells with their formidable Latin and Greek names wearies the sight-seers and, with few exceptions, the molluscan exhibit is passed by with but a glance. Of late years there has been a tendency to get away from this purely taxonomic exhibit and to mix in matters of a more popular character. Common names appear here and there and an occasional figure or descriptive label is added to illustrate either animal or habitat. It is evident, however, that a complete rearrangement must be made in exhibits of this character if the general public is to be interested to any extent.

Before an exhibit is planned, it is always wise to consider the class of people for which it is being prepared. In Chicago, for example, we know full well that of the many thousands of visitors which crowd the halls of the museums, only the very smallest fraction have the least interest in shells from a purely scientific point of view. The schools, graded and high, are also not interested in the purely taxonomic exhibit, but look for something which will illustrate general principles. The lay visitor is interested in knowing something of the uses to which shells are put, and also where and how they live. People who travel (and this class forms a goodly percentage of the visitors to the museums) wish to know the names of the shells which they have gathered in California, in Florida, or in some other part of the world. Now, knowing, as most museum men do, that it is this class of people that make up by far the largest percentage of the attendance at our museums, why do we continue to present them with the same old exhibits of endless series of genera and species. Truly there is need for us to halt and carefully study the situation.

With this condition in mind, the writer would suggest the following scheme of an educational exhibit of the Mollusca:

TAXONOMY

A synoptic collection should be exhibited, illustrating the broad principles of classification. All of the more important families should be represented by a few typical species, including a fair representation of the extinct groups. Each family should be headed by a large descriptive label, giving in simple language the principal characteristics of the group, its distribution and the number of species contained therein, recent and fossil. Notes might also be made concerning its bathymetrical or hypsometrical range, its peculiar habitat relations, etc.

GEOGRAPHICAL DISTRIBUTION

Under this head might be included an exhibit of those genera or families which have a restricted distribution or are peculiar to certain places, as, Campeloma to the eastern United States; Cerion to the West Indies and Florida; Polygyra and Ashmunella to portions of North America. Achatinella, some of the Jamaican Helices, the Philippine Helicoslylas and other similar groups would make very useful and instructive exhibits of this character. Maps and photographs should also be freely used.

FAUNAL EXHIBIT

A collection illustrating the prominent species inhabiting a given area is of great value in interesting the public, as travelers are constantly asking for information concerning the shells which they have found in California, Florida, or in other parts of the world. An exhibit of this kind might include such topics as:

Marine shells of the Pacific Coast.
Marine shells of Alaska.
Marine shells of Florida.
Marine shells of the Atlantic Coast.
Land shells of California.
Land shells of Cuba.
Fresh-water mussels of the Mississippi Valley.

An exhibit of local Mollusca should be included in this series.

ECOLOGY OR HABITAT RELATIONS

This subject is now claiming the attention of many biologists and should receive adequate recognition in museum exhibits. The Mollusca are especially adapted for this character of exhibition, occupying, as they do, a large variety of habitats. Models, as well as photographs, should be freely used to illustrate the mode of life of snails and other mollusks. Such subjects as the following would prove interesting:

Snails of a muddy beach.
Snails of a sandy beach.
Snails of a rocky beach.
Mollusks of the swamp.
Mollusks of the rivers.
Mollusks of the ponds and lakes.
Mollusks of the woods.
Mollusks of the deserts.
Molluscan adaptations to environments.

Structural Characteristics

An exhibit illustrating structural relations is of great value and should include:

Gross anatomy.
Variation in shell forms, as sculpture, hinge, form of shell, of lip, of spine, etc.
Forms and uses of muscles.
Color patterns.
Secondary coatings.
Form of egg capsules and young.
Development or metamorphosis.
Internal structure of shell.
Carnivorous snails.
Herbivorous snails.
Land, fresh-water and marine shells.
Shells of Arctic, temperate and tropical climes.
The radula.
Shelled and shell-less snails.
The operculum; its use and variation.
Dextral and sinistral shells.
Pathologic shells.

Protective Adaptation and Mimicry

This subject is one which contains great possibilities and one which has received but little attention. Many of the Mollusca exhibit protective adaptation of a high order, as, for example, the Xenophora, the Crepidulas, some West Indian Cylindrellas, and a number of others. Many interesting results may be obtained from a study of this subject.

Economic Mollusks

To the proverbial "hard-headed" business man, this subject appeals and will win his approval when the scientific collection is treated with disdain if it is not actually condemned. The general public, also, is interested in this topic and much of great value may be taught by an extensive and well-arranged exhibit. Under this head such subjects could be treated as:

The pearl-button industry.
Mollusks used as food.
Shell money.
Mollusks used in manufacture of ornaments, etc.
Pearls.
Injurious mollusks (as *Teredo*).

The above seven topics briefly outline some of the principal features of a possible educational collection of Mollusks. It is the writer's conviction that the purely taxonomic collection should be absolutely divorced from the exhibit collection, for each interests a totally different class of people. The serious student wishes to quietly compare or study large series of specimens, while the lay visitor and the amateur students are interested in general principles or in the usefulness of this class of animals. The study collection should, therefore, be kept in a different part of the building, if possible, where the general public cannot gain access to it but where it may be consulted by the serious student under proper restrictions. Descriptive labels in large, clear type should be plentifully, though judiciously used, wherever possible.

No such plan of exhibit as that outlined above is known to the writer to be on exhibition in any museum, but he believes that at no distant day some plan similar to the one outlined will be put in concrete form by some museum man with the time and means at his disposal. An attempt is now being made to arrange the collection in the Chicago Academy of Sciences along some of the lines indicated.

President Holland.—"There is opportunity for brief discussion of the paper."

Professor E. S. Morse (*Peabody Museum, Salem*).—"The exhibition of our mollusca has been a continual embarrassment. I wonder if there are many people more interested in the habits of the creatures than in identifying the specimens they have in their own collection. It seems to me there are more inquiries by those who wish to know what their species is.

"In Salem we have only square tablets on which we exhibit a few specimens of each family, and others on which we exhibit a few specimens belonging to the different families. I should very much like to see Dr. Baker's idea carried out. I am planning to have a shell come directly under the glass. There is no end of improvement that can be made in exhibition of our shells. I think it is very important that, in a local collection at least, every species should be exhibited."

Mr. Frederic A. Lucas (*Brooklyn Institute Museums*).—"If Mr. Baker were not a practical museum man, I would ask him if he realizes how much space his plans would take. We have every family of shells represented in the Brooklyn Museums. The local shells are by themselves and an exhibit such as Mr. Baker mentions would be interesting, but it would take an enormous amount of room."

Secretary Rea.—"I would like to say in reference to Mr. Baker's experiment, that it will take a comparatively small amount of room if he installs it. I have never seen so much displayed in a small space as in his museum in Chicago."

Mr. Baker.—"It would not occupy more than half of my gallery, and you know the size of that. It would reduce the taxonomic collection to a minimum. I hope to install a collection similar to the one I have outlined."

Dr. Hermon C. Bumpus (*American Museum of Natural History*).—"It seems to me we are passing over one remark that was made by Mr. Baker without giving it all the attention it requires; namely, the *purpose* of the exhibit of mollusca. Those who come to the museum for the purpose of identification merely are interested in the taxonomic exhibit. While it is commendable that such people should be incited to an increased interest, we should not forget that it may be equally commendable if interest be excited by other methods. I have in mind the collection which illustrates the pearl button industry in the Mississippi Valley. If interest results from this method of approach, it is just as good as the approach of taxonomy. Interest in mollusca as such, you must succeed in arousing, it matters not what the method is. One thing does matter, however, and that is what method is more successful than another."

Mr. Baker.—"I would say that ninety-nine out of a hundred respond to an appeal which is made from the industrial side."

Mr. Charles R. Toothaker, curator in the Philadelphia Museums, then read the following paper:

EDUCATIONAL WORK OF THE PHILADELPHIA MUSEUMS[1]

The majority of the members of this society are, I believe, familiar with the educational work of The Philadelphia Museums as it was carried on up to the time of the last annual meeting. I shall therefore not describe the general plan of the work in detail but give only such points as are necessary to an understanding of two new features which have lately been added.

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[1] Mr. Toothaker showed a cabinet 3 feet 6 inches high x 17 inches x 11 inches, containing nine glass-covered drawers and a closet, as a sample of one of the new collections for elementary schools, and several sets of colored lantern slides, with typewritten lectures. Examples of the lanterns and screens which are loaned were also shown.

Briefly stated, the educational work of this institution consists of—

1. Free distribution to public schools in Pennsylvania of systematic collections to aid in the teaching of geography, commerce, industries, and natural history. These collections contain the important materials which form the bulk of the world's commerce and include a selected series of photographs to illustrate the various subjects. Carefully prepared descriptions are printed on the backs of the photographs, and a book on commercial raw materials, with many maps and diagrams, accompanies each collection.
2. Daily illustrated lectures in the Museum to classes from public and private schools of Philadelphia. These lectures take up the countries and products which are studied in the regular work of the school, and are supplemented by a study of exhibits in the Museum.
3. Lectures to the general public, to teachers, and to various societies on geographical, industrial, and economic subjects.
4. Special information to merchants and manufacturers—the work of the Bureau of Commercial Information.

The collections which have previously been given to Pennsylvania schools have consisted of some specimens in bottles and others in loose form, such as hanks of fiber, or samples of minerals. The schools receiving the collections have been required to furnish show cases large enough to properly accommodate the material and preserve it. Many of the smaller country schools are poor and it has seemed practically impossible for them to get money to pay for the show cases. Some of these schools, it seemed to us, were perhaps in greater need of these aids to teaching than the city schools.

After consultation with many teachers, we devised and are now distributing to elementary schools this new collection, in which a selected series of specimens is contained in a small cabinet of drawers. Each drawer contains the specimens which illustrate one subject: for example, one drawer shows the principal products of the corn plant; i.e., a section of an ear of corn, samples of different kinds of grains of corn, popped corn, corn flakes, hominy, corn meal, corn starch, dextrine, corn oil, corn rubber, glucose, corn syrup, corn whiskey, and corn pith.

Another drawer shows a small silkworm, a mature worm ready to spin a cocoon, mulberry leaves, cocoons, pierced cocoon from which a moth was hatched, the moth itself, a chrysalis, the eggs, raw silk, spun silk, artificial silk made from wood pulp, tussah silk thread and pongee, and samples of silk, satin, velvet, and bolting cloth.

Other drawers illustrate rice, tea, coffee, chocolate, the cocoanut palm, the flax plant, the cotton plant, products of the sheep, and the important forms of carbon and of hydrocarbon products.

Specimens which are in powder or granular form are placed in light pasteboard boxes with glass covers, and liquids are held in small flat bottles. All the specimens are securely fastened to the bottom of the glass covered wooden drawer so that there is absolutely no danger of anything becoming disarranged or upset. Labels are pasted directly on the bottom of the drawer beneath each specimen. Before the specimens are installed in the drawer, everything is thoroughly fumigated and many of the specimens are treated in such a way as to prevent fermentation or mold from causing harm. In a small closet at the base of the cabinet is a series of a few important economic minerals and of the chief woods of commerce. The photographs and the book on commercial raw materials which accompany this small collection are also in this closet.

There is a very large demand for this new collection, and it has been commented on in the most favorable way, by some of the foremost educators of Pennsylvania, and by those of other states who have seen it.

The second new piece of work is what we call our "Loan Lectures." The daily lectures to the schools of Philadelphia have been so successful that we are now attempting to give, as nearly as possible, the same facilities to schools in distant parts of the state. We have therefore prepared a considerable number of sets of colored slides illustrating the following subjects: Philippines, Japan, China, Hawaii, South Sea Islands, West Indies, Mexico, Niagara Falls, Lumbering, and Panama.

Each set consists of from sixty to seventy slides and is accompanied by a type-written lecture in which each slide is described in detail. The lecture can be read from the type-written sheets in an hour or a little more. The slides are all of them beautifully colored and the lecture is a great deal more than a travel talk. It is a careful study of the people and the industries of each country which is taken up.

These lectures are loaned absolutely free of cost to schools in Pennsylvania. While the plan has been in operation only a few months it is no longer an experiment but a pronounced success, and the demand is so large that many duplicate sets are being prepared and new subjects are to be added. One or two slides in each set show exhibits in the Museum which illustrate the subject of the lecture and do a little to make the Museum better known throughout the state.

If the school desiring to borrow a loan lecture does not possess a stereopticon we loan with the slides a lantern and screen. The lanterns are of the very simplest pattern, and are accompanied by such plain directions for operating that they are handled successfully by country teachers who are absolutely unfamiliar with such apparatus and who never handled anything of the kind before. The lanterns are fitted with either electric arc lamps or incandescent electric bulbs when they go to schools where the electric current is available. In other places the illumination is supplied by a kerosene lamp, which gives excellent results and is thoroughly simple, safe, and reliable.

The loan lectures are often used by the teachers to furnish at the same time instruction to their scholars, and an evening's entertainment to the parents and friends. This new plan is thus aiding to make the country school house a social center.

Mr. C. G. Rathmann (*Educational Museum, St. Louis, Mo.*).—"I would like to ask if Mr. Toothaker has had an opportunity to ascertain to what extent the material is used."

Mr. Toothaker.—"These cabinets have been only recently sent out."

Mr. Rathmann.—"Having charge of the School Museum I have followed the work of the Philadelphia Museums with interest. We needed material very much and the Philadelphia Museums were kind enough to send it to us free of charge, and I want to thank Dr. Wilson and Mr. Toothaker publicly for their kindness."

Dr. A. R. Crook (*Illinois State Museum of Natural History, Springfield, Ill.*).—"How many have you prepared, and what has been the cost?"

Mr. Toothaker.—"Three hundred of the small collections. I cannot quote prices from memory. They have probably cost us in the neighborhood of forty dollars a piece, but that is merely an estimate."

Treasurer Wilson.—"There is a great deal of hand work here. We have not all the data in reference to what it has cost. I think we can do it for much less than forty dollars each. There are minerals and other things that you have not seen, common woods, and various things that it is impossible to take time to speak about. Probably the cost could be gotten down to thirty dollars. Next time we shall probably make eight hundred to a thousand at one time. Ordering by the hundred the cost of the case with the glass and everything complete is nine dollars, made by a good firm and put together with screws and warranted to stand the wear and tear of small children. We give them outright. We have nothing to do with them after they go out, except to keep them in order. They go all over the state in the ungraded country schools, and there are eighteen thousand in Pennsylvania. We have set out to make eighteen thousand cabinets if possible. We get an appropriation for the school work of twenty-five thousand dollars every two years, and we never tried to get any more, because it was about all we could use economically and carefully for our school work."

President Holland.—"The State of Pennsylvania gives eleven millions each year for the support of her schools. She is very liberal.

"We will now proceed to the next paper, which is by Mr. W. H. Schoff of the Philadelphia Museums."

THE HISTORY OF COMMERCE IN MUSEUMS

Commerce between different communities of men is at the beginning of all civilization, and is the compelling cause of all achievement in the arts and sciences. Communities, which themselves contain the essentials of life or which, by their location, have been excluded from free communication with their equals, have not produced a degree of civilization such as to impress the world or to have an enduring record in history. It is the lack of essentials, or the ability and enterprise to acquire them elsewhere more advantageously than they can be produced at home, that stimulates any community to extra effort and enthusiasm; first, toward increasing the value of its stock available for barter and, second, toward its own education and improvement and the fitting enjoyment of its artistic and scientific achievement. Therefore a history of the commerce between nations is, more than any chronology of wars and dynasties, a history of the progress of the peoples interested; of their success and failure, their national glory and decline. And a graphic record of that history, so presented as to leave a consistent and consecutive impression on the mind of a spectator, cannot fail to be a helpful introduction to a more specialized interest in almost any direction.

The materials for such history are multiplying with wonderful rapidity, as the annals of recent centuries are collated and printed, and as the vastly more difficult period of ancient history is opened to view, millenium by millenium, by archæological discovery and research. It is not so many decades since the limit of our knowledge was the caravan of merchants bearing spices, balm and myrrh into the land of Egypt, by whom Joseph was carried off and sold into slavery; nor since a school of criticism under French inspiration was trying to prove that at such an early period in human development, before the invention of writing and the establishment of industries it was impossible that even such a measure of regular trade should have existed. It is now certain that those merchants were the intermediaries between the great centers of trade which had already existed perhaps more years than have since elapsed to our own day and which were even then in their decadence, and steadily overrun and subdued by those very commercial intermediaries, the nations of Arabia.

As we examine the evidence before us it appears that even earlier than the commerce in which Arabians were the merchants, was that commerce which came to the Persian Gulf from India in ages still but vaguely indicated, before Aryan or Semite had appeared on that scene of activity, the extent of which is at least suggested by the impress which it has left on the records and traditions of both.

But without indulging in speculation as to origin of the so-called Babylonian Creation Epic, which seems at least to be an Odyssey of this pre-Semitic commerce, we have the Egyptian records of the Palermo Stone, telling us of a census taken about 3300 B.C., of shipbuilding on a large scale in the 30th century, and of the building of 100-cubit ships a century later; 180 feet is still a fair length for a coasting schooner. By the 28th century there was a steady import trade in copper and electrum, myrrh and ebony and doubtless many other substances; and by the 20th century the lapis-lazuli of Afghanistan, and the precious stones of India, found an increasing demand, and the conquests of Sesostris had led to the establishment of regular markets and custom houses at the borders of the kingdom.

Meantime the culture of the Euphrates had advanced even further. Earlier than the beginning of the dynasties in Egypt, it had sought the copper of Cyprus and organized a series of trade routes that led from the Indian Ocean to the Mediterranean. Fourteen centuries later we have the well-settled commercial practice of the country codified by Hammurabi, providing, among other things, for the use of bills of sale under seal, for responsibility in case of loss in injury to goods in transit, and for the assessment of damages against the owners of a merchant vessel under way which might run down another at anchor. And all this before that caravan of Joseph!

The materials for subsequent periods need hardly be referred to here; the inscriptions of Egypt down to the Persian conquest; the records of the Hebrew kingdoms, particularly that famous denunciation of Tyre by Ezekiel, through which he has preseved for us a detailed statement of the commerce of the Phœnicians; the inscriptions of Assyria; the laws of Manu in India; and finally the definite sequence of written history, through the days of Greece and Rome, the Caliphate and the Italian republics, down to our own time.

Too great value can hardly be placed on the results of discovery and research originated here in Philadelphia. Without the treasures unearthed and interpreted by the archæologists of the University of Pennsylvania, and steadily being added to the exhibits in its museum, our knowledge of the commerce of the distant past would be but a fraction of what it can now be.

The selection and presentation of essential facts from this vast mass of material, and their display in graphic form, consecutive order, and limited space, is an object of the exhibit now under preparation in the Philadelphia Museums. Under the plan adopted there will be confined in the exhibit:

1. A series of maps, at typical periods of history, showing national or political divisions and principal trade routes at each period selected, and provided with just enough notes to make the maps intelligible.

2. In the same cases with the maps, specimens of the products entering into commerce during the period illustrated, so labelled as to show their origin and destination and anything else of importance.

3. Adjoining the maps a series of models of commercial shipping at all periods of history, based on contemporary description, and made to uniform scale so that the spectator may see at a glance the relative size and capacity of merchant ships at different periods. The comparison of the ships of ancient Egypt with the maximum of Roman enterprise, and then with a modern steamer or sailing vessel, is thus made easy and impressive.

4. Surrounding the exhibit, a series of pictures will show the development of transportation from the bearer of burdens, the hewer of wood and drawer of water, through the various stages of vehicle construction down to the modern railway train, automobile and airship.

The material now in the cases, comprising a preliminary display at an exposition, is subject to considerable alteration, especially as to the method to be employed in coloring and annotating the maps. It is no easy matter to choose between the facts that ought to appear in print, and those which by their very simplicity are likely to be read. Neither is it easy to choose between a map in which boundaries and routes tell their own story, and one in which solid color and lettering both distract and assist the eye.

The models of shipping, when the series is completed, will form an exhibit of especial interest. We ought all to be familiar with the splendid collections in the National Museum at Washington and the Peabody Museum at Salem. There are fine collections abroad at South Kensington and in the Louvre. But this series in Philadelphia, as far as known, is the only one in which the attempt is made to follow the course of seaborne commerce from its earliest beginnings in the dug-out canoe or raft to the modern trans-atlantic leviathans. The only series of similar purpose, although in a different medium of expression, is the fine collection of mural paintings by Mr. Millet just installed in the new custom-house at Baltimore; a collection which every one interested in the merchant marine ought to see and understand, and to the author of which I acknowledge deep indebtedness for generous assistance and suggestion, notwithstanding his characteristic assertion that my models "made his painted things look like thirty cents!"

The purpose of this historical exhibit is of course to educate the public or rather to suggest a consecutive idea which may be carried out or not as the spectator wishes. It can therefore hardly aim toward new discovery, but rather toward a selection and popular presentation of material which is too apt in more intensive treatment to be given distorted expression or to be lost altogether to the general public. Its completion should not only contribute toward the educational work of the institution, but also provide a means of introduction to the specialized collections of the commercial products and natural resources of the different nations of the world, which form so large a part of the exhibits of the Philadelphia Museums.

President Holland.—"The next paper to be presented is by Mr. John J. Macfarlane, librarian of the Philadelphia Museums."

THE ADAPTATION OF A LIBRARY TO A COMMERCIAL AND ECONOMIC MUSEUM

It cannot be expected that in the few minutes allowed me to discuss "The Adaptation of a Library to a Commercial and Economic Museum," that I can explain fully the peculiarities of this Library and its adaptation to the commercial and economical features of the Museums.

At a conference of museums held in Glasgow in 1901, Mr. W. E. Hoyle, when called on for an address, said that he thought he could best serve the purpose of their meeting by giving a brief account of an institution which seemed to him destined to render important services to the enlightened community which created it, and which impressed him as much as anything on the Continent, not excepting Niagara Falls and the Congressional Library. "I allude," said he, "to the Philadelphia Commercial Museum." While not assuming that the institution will impress you to the same extent, nevertheless I believe if you could take the time he did to investigate the commercial end of our Museums you would, like him, be surprised at the perfect adaptation of its methods to accomplish the end desired. An important part of these methods is accomplished by the Library.

Among the objects set forth by the promoters of the Museum was, "to gather from all parts of the world and to make immediately available to business men full and specific information concerning trade conditions and trade connections." This is the part of the work of the Museums assigned to the Library, and you can see at once how necessary the Library is to the work of the Museums.

In carrying out the purposes of its promoters we have collected here the official reports of the imports and exports of about seventy-five different governments, including practically all that publish such reports. We have not only their annual reports, but also the monthly reports of many of them, so that we are able to furnish the latest information as to the trade of these countries almost as soon as institutions in their own land.

I have placed here on the table illustrations of this class of books. In Europe I have placed those of Greece and Servia, as well as those of England and Germany. An interesting fact in regard to the Balkan States is that their publications, while in their own language, have parallel columns in French. In Africa we have Egypt and South Africa, those of Egypt being published in French. In Asia we have Japan and China, those of Japan being both in Japanese and English. The Chinese publications are in English. We can readily see from this that English is the commercial language of Asia. In South America we have Uruguay, Peru, Argentina and Brazil. The publications of all the countries in South America, excepting the Guianas and Brazil, are in Spanish; those of Brazil are in Portuguese. In Oceania we have Australia and the Dutch East Indies, the latter being in Dutch. In North America we have Mexico and Canada.

These are only a few and are selected in this way to show how universal our collection is. In addition to this class of works we have the official gazettes of the various nations which contain valuable information on subjects other than commercial statistics. The reports of 400 Chambers of Commerce and Boards of Trade may also be found here on our shelves and, what will interest you most, the reports of 94 museums, most of them foreign. We also have one of the best collections of books on the history of commerce to be found in the country. This part of the Library is unique in its character. No library in the country, not even the Library of Congress, has a more complete collection of statistical publications on commerce issued by foreign countries. But this is only one side of our work. In order to make these works serve their full purpose, viz: to furnish information to business men, it is necessary to supplement them by books of travel in the various countries of the world, descriptive of their natural features, climate, geology, plant and animal life. people, manners and customs, industries and productions.

For the use of the Scientific Department we maintain a library of scientific books covering botany, zoölogy and geology, treating on commercial materials, such as foods, fibers, resins, and oils; also books describing the processes of manufacturing raw materials.

We have also on our files 650 trade and other papers, of which 370 are from foreign countries. Another class of books, of which no other library probably has as large a collection, is the directories. We have here the directories of every city of the United States having a population of 100,000; and of all the large important cities of the world, as well as trade directories of the leading centers. There are also books on international commercial law of many countries and a number of code books which are found exceedingly useful to our business men.

From time to time the Library prepares commercial charts, such as you see hung here, and commercial articles on the leading products, which are published in the monthly publication, known as Commercial America. The translation work of the Bureau is done in the Library. Last year 17,593 letters, containing 2,931,000 words, were translated by this department.

From this condensed statement of the contents of the Library you can readily see how important a factor it is in the commercial and economical work of the Museum, and when we think how frequently great results in industries have followed from the use of books by comparatively uneducated men being able to discover economies in the manufacture of various products with which they are associated, the immense importance of a library of this kind to a commercial museum cannot be overestimated.

A lesson on Commerce can be taken from the Charts on the wall. In the two charts on the Commerce of the World, the exports from and the imports into the four countries, Great Britain, United States, Germany and France, represent nearly 50 per cent of the world's trade; to be more exact, 47 per cent. The United States is second in exports, but for a number of years has alternated with Great Britain in holding first place.

In the charts on the United States we see that Great Britain and Germany not only sell more to the United States, but also buy more from the United States, than any other country. We also see that a country, like Brazil, from which the United States buys enormous quantities does not reciprocate in her purchases. In the charts of the United States on products, we find that cotton represents almost one-fourth of all our exports, while in imports sugar leads all other products. If the sugar coming from Porto Rico and Hawaii were included, the figure would be much larger.

The chart of Great Britain shows that that country buys more from the United States than any other country, its imports therefrom consisting largely of food products and cotton. The same fact is probably true of Germany, although the detailed statistics for 1908 are not yet available. In 1907 Germany bought more from the United States than from any other country, mainly cotton, copper, and food products. These facts show why neither Germany nor Great Britain can afford to go to war with the United States, for to do so would cut off the supply of cotton and food products, thereby closing enormous industries employing large numbers of people for want of that which cannot be obtained from any other place.

In Mexico one-half of all the imports are from the United States. In Canada more than one-half come from the United States notwithstanding the preferential tariff in favor of the mother country, Great Britain. In Japan the United States ranks second in imports, although it buys more from Japan than any other country. The most striking case, however, is that of Cuba, in which one-half of the imports are from the United States and more than three-fourths of the exports are sold to the United States.

The chart of the leading textile cities of the United States will bring out a fact which probably is unknown to most of you, viz: that Philadelphia produces more textiles, included in which term are cotton, woolen, worsted and silk goods, carpets, hosiery and knit goods, than the next three textile cities of the United States. It is not only the largest manufacturing city of the world, but probably the largest textile city of the world.

Treasurer Wilson.—"We started out with a charter, so to speak, from the Councils of the City that we might develop a group of museums.

This was first mentioned in the original act passed by the Councils of the City and was later re-inforced by the charter from the State. The emphasis has been laid upon the commercial side of everything here because it touched the commercial and the manufacturing interests and it was thus possible to obtain the money for our work.

"We have a bureau, which carries on the commercial work, employing thirty people. All the money comes from the manufacturers who use the bureau, the income last year being $32,000. The library is supported by the city, and is conducted as an open and free library of reference for the people of the state and the country. The bureau answers questions and does all kinds of work for manufacturers throughout the United States, but must depend on its own resources. We ought to have some good people who would endow the bureau so that we could furnish this information free to every Chamber of Commerce and every Board of Trade in the United States. There are two publications, a monthly and a weekly, the latter being a sort of confidential journal to those manufacturers connected with the bureau. The monthly contains accounts and illustrations of the fine inventions, all sorts of mechanical devices, and those peculiar things in which we stand at the head in the United States, bringing them to the attention of the foreigner who wishes to know what we are doing."

President Holland.—"We will now hear the report of the Auditing Committee."

May 12, 1909.

To the Members of the American Association of Museums:

Your Auditing Committee reports that the statement of the Treasurer has been examined and found to be correct, with proper vouchers for all expenditures.

The Committee suggests that in the printed report the purpose for which the several expenditures were made be stated.

GEORGE FRANCIS DOW,
FRANK C. BAKER,
O. C. FARRINGTON.

On motion duly made and seconded the report of the Auditing Committee was adopted.

The Association then adjourned to another building where the following paper was read by Mr. Fred D. Maisch, photographer in the Philadelphia Museums.

PHOTOGRAPHIC ENLARGING METHODS

In fitting up a room for making bromide enlargements, the first consideration is the selection of a suitable light. The electric arc light on account of its high actinic power is generally used. A window facing north, free from reflections from brick walls, is also a suitable light. But both these lights are open to objection. The arc is unsteady in its illumination, on account of the crater constantly travelling around the carbons, and because of its great heat cannot be boxed in. It must, therefore, be mounted in an adjoining room, its light passing through an opening cut in the partition and accurately fitting the condenser cells which one desires to use. The lamp used is of the automatic adjustment type, and is, of course, entirely beyond the control of the operator. Daylight is objectionable because of its subtle changes, which cannot be accurately judged in the dark room.

In our dark room neither of these two sources of light was available and we were forced to resort to the incandescent electric light. This is not in general use because of its comparatively low actinic power and the difficulty of adjusting a reflector so as to assure an even illumination. On the other hand it has great advantages: it is reasonably steady, can be completely boxed in, and with a button on the outside of the light box is completely under control.

Figure 1 shows the arrangement of the light box. The inside dimensions are: 24 x 12 x 12 inches. The distance from the nearest point of the bulb to the front is 18 inches, and the bulb used is one of the new Tungsten lamps for which 250 candle power is claimed, requiring a comparatively small amount of current. The reflecting surface is corrugated mirror glass arranged in such a way as to eliminate all right angles and make every ray of light active and useful.

The length of the box was determined by the angle of reflection from the brightest part of the lamp to the strips of mirror glass in the corners of the box, and out to the front, insuring perfect illumination along the diagonals of the negative. The usual method of determining the length of the light box is based on the focal length of the condenser system, the distance between light and condensers being about equal to the focal length. In the box under consideration this focal length was disregarded. The intention was to secure the greatest possible amount of light at the circumference of the condensers. The results are: even illumination over the entire negative, loss of light for small or moderate enlargements, but a decided gain in diffusion of light for great enlargements. In other

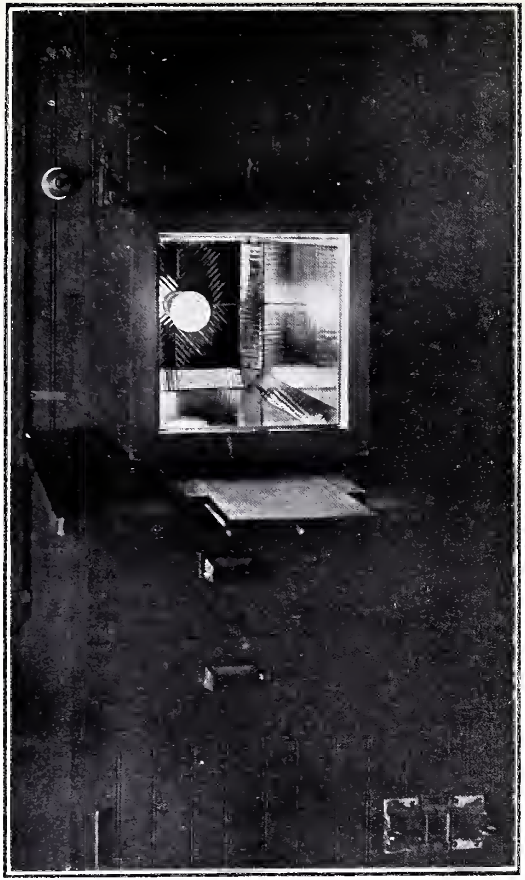

FIGURE 1

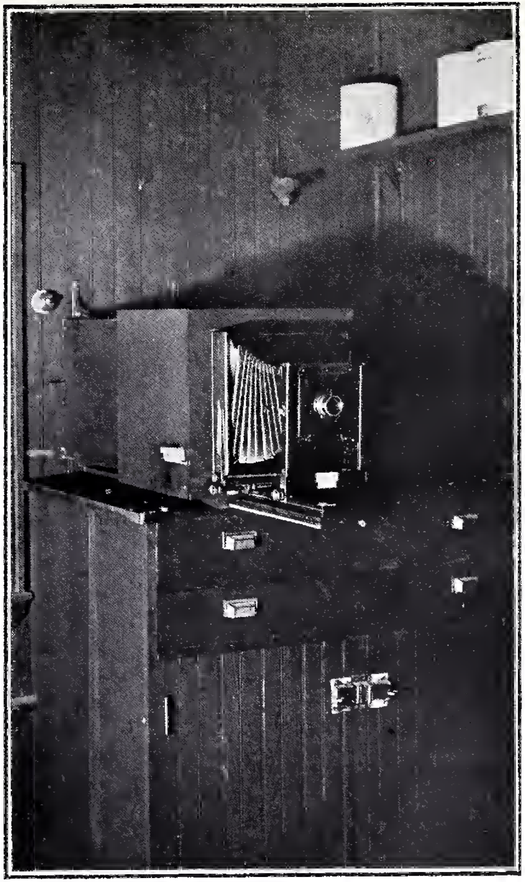

FIGURE 2

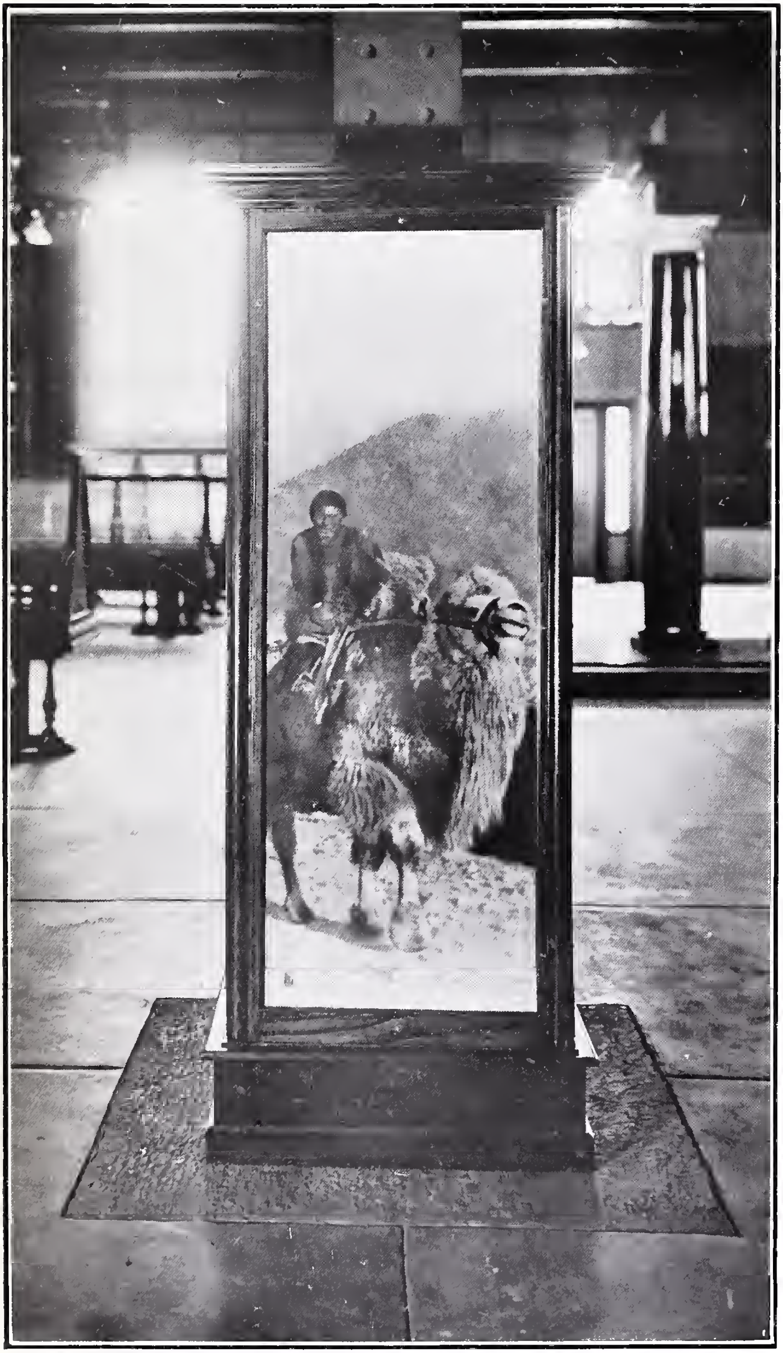

FIGURE 3

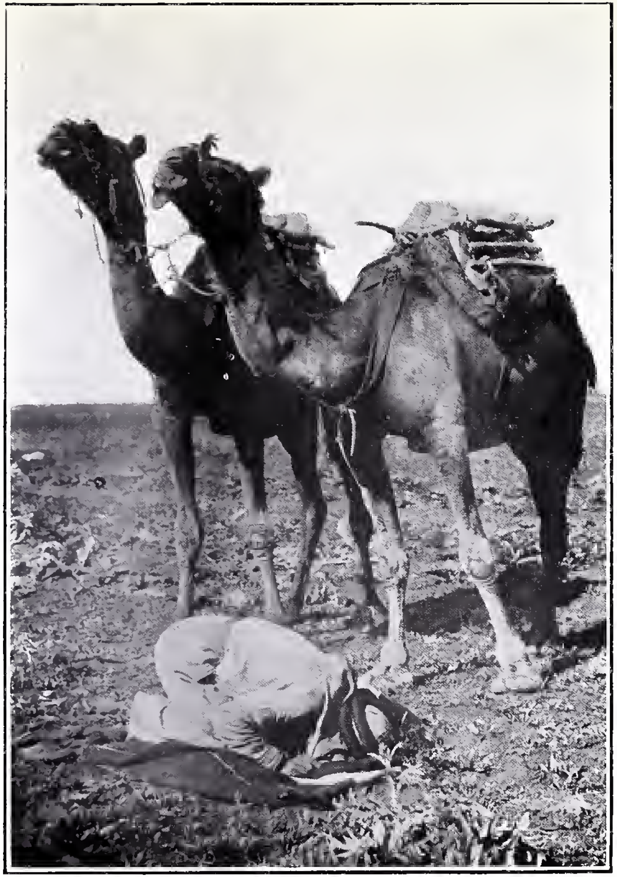

FIGURE 4

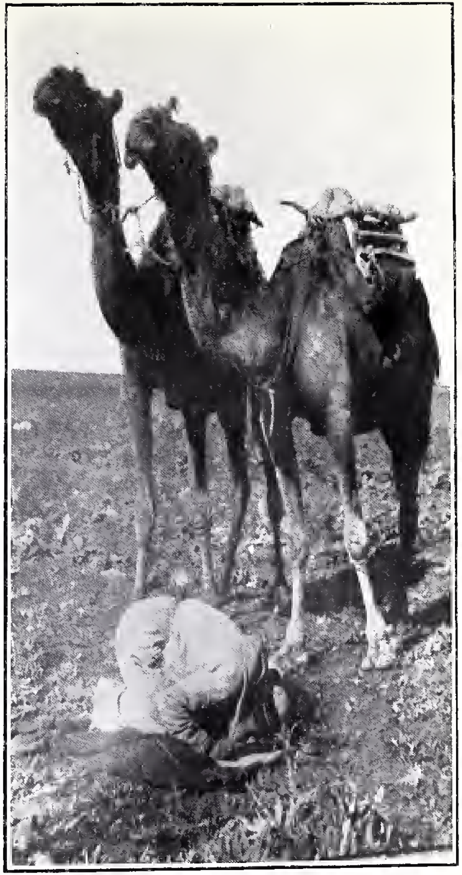

FIGURE 5

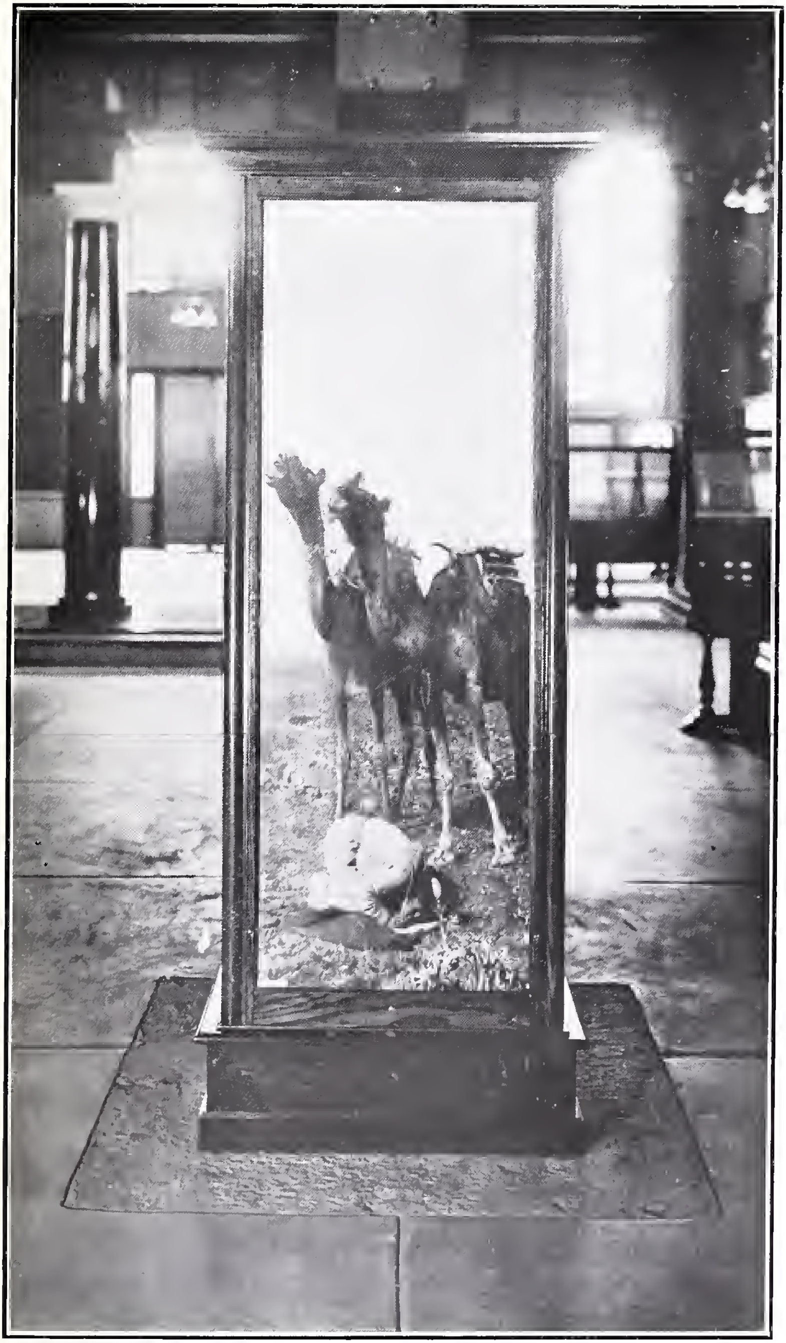

FIGURE 6

words this arrangement prevents in great measure the objectionable contrast so often shown in enlargements of extraordinary size.

Telescoping over this light-box is the box holding the condensers, which are twelve inches in diameter. The condensers are adjustable inside this box by means of blocks and screws moving easily in slots cut into either side of the box. The location of the slots was determined by the weight, height and thickness of the frames holding the condensers, and is the point at which the condenser frames can be moved with the greatest ease. A set of frames or kits holding any size of negative up to 8 x 10, either vertically or horizontally, fits into the front of the condenser box. The condensers are mounted in the usual manner, allowing space between for inserting a ground glass at will. The effect of the use of the ground glass is to diffuse or correct an apparently uneven illumination. The frames holding the condensers should fit snugly into the box.

Sliding in grooves under the boxes just described, and at right angles to the front of the condenser box, is a shelf for supporting the camera (Figure 2). The boards into which these grooves are cut furnish a firm support for the heavy condensers and reduce the strain on the light box to a minimum. The entire apparatus has been in use for two years and its alignment is as perfect to-day as it was when first installed. The lens used in the camera is a Voigtlander Collinear of $7\frac{7}{8}$ inch focus, which at a distance of nine feet from negative to easel will enlarge a figure measuring $3\frac{3}{4}$ inches up to $3\frac{1}{2}$ feet. The lens and condensers readily cover a negative measuring $6\frac{1}{2}$ x $8\frac{1}{2}$ inches. Our easel is 4 feet wide and 6 feet high, and made of $\frac{7}{8}$-inch stuff heavily and firmly braced.

The possibilities of bromide enlargements for museum use are perhaps best shown by a few illustrations.

The original negative of Figure 3 was made by Mr. Bailey Willis of the United States Geological Survey on his trip through northern China. From this I first made a 5 x 7 negative and enlarged that to a panel measuring 2 x 6 feet. The picture in the corner is a contact print from Mr. Willis' original negative and the actual enlargement is 33.6 diameters, or 1128 times the area. The original negative was made with an ordinary No. 1 Kodak, with no accessories other than those furnished by the makers. This proves that extremely serviceable pictures can be made with the ordinary snapshot camera, if it is used with care and good judgment.

These panel pictures are intended to form a part of an exhibit showing the evolution of commerce which is being arranged by Mr. W. H. Schoff of The Philadelphia Museums. At first we had considerable trouble in finding typical pictures which could be squeezed into this narrow panel, as will be clearly seen upon examination of the following illustration.

Figure 4 was the picture which we desired to use, but we found it to be entirely too wide to lend itself well to the proportions of the panel. The difficulty was solved by placing the pictures before the camera at an angle of 45° and making a copy with the lens stopped down to the smallest diaphragm, with the result shown in Figure 5. The finished bromide print as finally installed in the Museum (Figure 6) loses every evidence of distortion or foreshortening.

It is the Museums' intention to illustrate in these panels the most typical methods of transportation, beginning the series with the most primitive, the human burdens for personal needs, and ending with the modern limited express and ocean greyhound.

The Association then adjourned for luncheon at the Philadelphia Museums.

SESSION OF WEDNESDAY, MAY 12

Afternoon

President Holland.—"We will now hear from Mr. Henry R. Howland, superintendent of The Buffalo Society of Natural Sciences."

THE EDUCATIONAL WORK OF THE BUFFALO SOCIETY OF NATURAL SCIENCES IN COÖPERATION WITH THE PUBLIC SCHOOLS

The extension of their educational work on the part of American museums is a movement that awakens a widespread interest. The excellent papers which were read at the Chicago meeting of this Association are an evidence of the strong desire felt by our most active museum superintendents, not only that their valuable collections should attract and enlighten their many visitors, but that these collections and the other resources of their museums should be made to serve a purpose of especial educational value in connection with the teachers and pupils of the public schools. This attempt to supply concrete instruction in nature study which may enlarge and better, by the sight of the eye and the hearing of the ear, those things which have in former years come to the child only by the textbook and the class room teacher seems to be the present endeavor in most of our larger cities. Various methods have been adopted to compass this result, in most of which, we, of the Buffalo Society of Natural Sciences, were early sharers, but our tentative efforts spread over a period of very many years have, in these later years, resulted in an arrangement which is, perhaps, unique, inasmuch as, so far as I can learn, our Society is the first of its kind to carry out the successful experiment of directly correlating its distinctive work with that of the Department of Public Instruction so that the lectures and nature talks given daily in our own lecture rooms are made a compulsory part of the public school system of a great city.

We have received so many inquiries as to this arrangement and as to our methods, which seem to evince a widespread interest here and in Canada as well, that they may, perhaps, be a sufficient apology for briefly stating what we have essayed to do and how we are doing it.

During the half century of its existence the Society has always recognized that, in addition to its natural function of stimulating and encouraging original scientific research, a controlling purpose should be to further educational work in Buffalo by every means in its power. Its museum and its library have always been opened to the people for their free use and year after year popular lecture courses have been given during the winter months upon such scientific subjects as are of general rather than technical interest. These have always been free to the public.

Its first impulse towards extending its influence more directly in an educational way, came thirty-seven years ago when Charles Linden, ardent lover and student of nature, was custodian of our museum. An enthusiast himself, he had the rare gift of inspiring others and he organized a Field Club as a part of the Society's work. This was made up very largely of pupils from the Buffalo High Schools with whom Professor Linden, who was like Thoreau in his love of the woods and fields, would make weekly excursions for scientific observation and study. There was a freshness in his instruction as of nature herself. The interest thus awakened in the community grew apace and when, in 1878, the Department of Public Instruction introduced elementary science work in the Grammar Schools of Buffalo, our Society at once took steps to encourage the science teachers to bring their classes to its rooms and to utilize its collections for illustrative instruction.

This offer of assistance was favorably received and for many years these teachers brought their classes to the Museum, the collections of rocks and minerals, of native birds and animals, proving of great service to the classes and their instructors. At first no attempt was made to provide other lectures or instruction, but after a time a projection lantern was added to the Society's equipment and first employed to illustrate talks upon nature study given by school principals or class teachers to whom the privilege of the lecture room and the lantern were freely offered. Then traveling collections of scientific exhibits were prepared and loaned to the schools and at the beginning of each school year, having been returned always the worse for wear, they were, like the kiss which the lady returned to Roland, "revised, corrected and considerably enlarged" and started again on their travels.

After several years it was decided to begin a regular series of Saturday afternoon illustrated lectures upon such topics as Birds and Bees and Insects, arranged for such teachers and pupils as cared to come, the lectures to be given by Dr. Cummings, the secretary of the Society.

This plan when put into operation became at once a success. Attendance was voluntary but the familiar talks and illustrations so interested teachers and pupils, as shown by the large attendance, that, in the summer of 1905, an arrangement was made with the Department of Public Instruction by which the Society's rooms were placed at the disposal of the Superintendent of Education for the establishment of regular hours of daily instruction in elementary science by illustrated lectures and familiar talks to the grammar school children. These lectures became an integral part of the school requirements and were no longer optional, the attendance of the several grades being made compulsory. Since that time this plan has been carried out each year with most satisfactory results. The lectures are given by Dr. Carlos E. Cummings who is paid by the Society. When not lecturing, Dr. Cummings' time is largely occupied in preparing the lantern slides and the other materials used for purposes of illustration. On behalf of the Society he has made many summer journeys in which he has used his camera to excellent purpose and the Society now owns a collection of over 2500 fine lantern slides made by him which are freely used in its school and other lectures.

The Department of Public Instruction prepares each year a schedule which is sent to each grammar school principal notifying him of the day and hour at which each of the several grades in his school is to come to the Society's lecture room, the lectures being given daily at 10.30 a.m. and at 2 p.m. throughout the school year.

For the physiology classes, in view of the scanty equipment of school laboratories, a full supply of the necessary apparatus and chemicals is provided, so that all the usual experiments may be shown during the lectures. In the bird talks, actual specimens of birds are first shown and described and it has then been customary to throw a series of pictures upon the screen showing the homes of the birds and the enemies which are liable to attack them. This season the experiment has been made of having a smaller number of children at a time for these bird talks, when the birds, their nests and their enemies are shown them and their habits explained. They examine the mounted specimens individually, are questioned and encouraged to ask questions and a more abiding impression is thus made upon their minds. For illustrating the habits of bees, a hive of live bees is used, the walls being of glass so that bees and comb can be plainly seen. Bee-keeping utensils are explained and a remarkably beautiful series of slides prepared by Dr. Cummings from his own negatives, shows the bees at work upon the flowers.

Cases are arranged in connection with the fifth grade work, showing coal and iron and the mineral products of the United States, and the lantern slides show the localities from whence they come and the geographical wonders of the continent. So also, cases are prepared for the sixth grade work, showing the actual tropical products, such as cocoa, vanilla, cocoanuts, coffee, and rubber, and lantern slides are shown illustrative of their growth and uses. For the seventh, eighth and ninth grades special exhibition cases are arranged in connection with the work of those grades.

During the past school year 234 lectures have been given by Dr. Cummings upon physiology, tropical products, bees, birds, United States mineral and other natural resources and geography. There has been an attendance of about 20,000 children of the several grammar school grades from the fifth to the ninth inclusive, and an additional series of evening lectures has been given by Dr. Cummings on physiology for the especial benefit of grammar school teachers and advanced students from the high schools of the city.

At the close of each lecture the collections of the Museum are visited by the children under the guidance of their teachers. Each year the scope of the work is enlarged with the intent of holding and increasing the interest of teachers and their pupils and of the general public which profits by these educational endeavors. By such means and this direct systematic connection with the Public Instruction of our city, we believe a larger school work in natural science is accomplished and more effective results secured than was possible under the plan of voluntary attendance which was formerly followed.

President Holland.—"The paper is open for discussion and remarks.'

Mr. Frank C. Baker (*Chicago Academy of Sciences*).—"I am deeply interested in this subject as it is now coming to my institution. The public school teachers of Chicago are overburdened with work and they will do nothing unless there be credit for them in advancement of salary. For fifteen years, since the Academy of Sciences has occupied its quarters in Lincoln Park, I have been hoping the time would come when the public school teachers would come to us. I knew it would be time wasted to go to them. This year the teachers took the initiative and came to us for assistance. They said that they realized the nature teaching in public schools was very weak and asked for some loan collections to help out in their work.

"We got together collections in various lines; a few minerals illustrating coal products, and particularly collections of birds, as these requests were made in the spring when nature study consisted simply of bird work. We sent out several hundred collections, about forty schools having made the requests. They also wanted bird talks in the school room. That, of course, pleased us, because we felt this work should be conducted in close connection with the Board of Education and with the schools. So we have given about forty bird talks in the school room during the last six weeks. Each school in Chicago owns a stereopticon, so it was comparatively easy to conduct the talks. The Chicago schools contain 1500 to 1800 children each. In many instances, the talks were repeated three times in an afternoon, the children being divided into sections of three, four, or five hundred each. The talks lasted from twenty minutes to half an hour.

"We have also had the children and teachers come to the museum, and have conducted bird classes in Lincoln Park with good results. My experience has been that the talks have much more value when given before 25 or 30 children than before an assembly of four or five hundred. I also found that much good was obtained from a quiz: showing a picture, for instance, saying one or two words about it, and then asking questions which the children answer.

"Now the proposition before my institution is to take up this work for the city of Chicago. I wish that others interested along this line of work would tell of their experience concerning the relation of the public museum to the public school system."

Mr. C. G. Rathmann (*Educational Museum, St. Louis, Mo.*).—"I know the American Museum of Natural History in New York is doing excellent work. Could we not hear from Dr. Bumpus?"

Dr. Hermon C. Bumpus (American Museum of Natural History, New York City).—"I think the circulating collections presented by Mr. Toothaker are manifestly superior to any we have sent out, and, as far as my knowledge goes, are the best I have seen, and the best I could conceive.

"In regard to our educational work, we are trying to assist the public schools along three lines. The work has been done under the supervision of Mr. Sherwood, who is better acquainted with it than I am. We wish the teachers to tell us what they want, and then we endeavor to supply their needs. We feel that it is better to loan the collections and circulate them than to donate them. The donations are likely to fall into a state bordering on dissolution. Our plan has necessitated the employment of a considerable staff because there are 500 schools in New York. We send a man out with an automobile, and he keeps the collection circulating. The event of arrival of a collection in a school has, we believe, an educational value.

"We also meet the public schools in a system of lectures, but these are so much like the lectures that are given here, with which you are well acquainted, that I will not emphasize this side of the work.

"Finally, we are thoroughly convinced that it is a proper thing to have a change in the bill board. A person twenty years of age who has visited a museum has a feeling that it is not necessary for him to visit it again; he has 'seen the museum.' Now if any theatre or publishing concern should adopt the policy of an unchanging attraction it would not be successful. We are very much in favor of having temporary exhibits, even though they disturb the general appearance of an exhibition hall. One of these was the tuberculosis exhibit, and at that time we had on one day an attendance of 63,000. The handling of 63,000 human beings in four or five hours of time is a noteworthy performance in the history of museum work. It was felt in connection with this temporary exhibit that it would be a valuable thing to have the public school children see it, but the handling of a large number of school children was a problem.

"The arrival of from six to nine thousand school children gives a chance for great confusion, and our experience may be of a little benefit to you. In the first place, plans for handling them must be already made. We shunted them into halls, two or three hundred in one hall, and there lined them up in rows. All school children will understand how to stand in file. They are like a flock of sheep and if you can keep them in blocks you can control them. We find that they cannot be carried through the museum unless they have been given a little instruction so that they will understand what they are to see and do. We have a lecture hall seating 1500. There they were told what they would see and then they filed out and passed through the exhibit. As the school children passed, instructors, standing on pedestals, told them what they were looking at. We handled from five to ten thousand children in the morning. Many teachers told us the children were not technically instructed. We persuaded the teachers that they had a misconception of our idea. We intended this visit only for general information, and the teachers all agreed that the time spent by the school children had been profitably spent."

Mr. Henry W. Kent (*Metropolitan Museum of Art, New York City*).—"In the case of the Metropolitan Museum of Art we have provided a class room where teachers can come with their children and have a lecture with lantern slides or without them, then go into the museum and see the things themselves. We send leaflets telling them about it.

"We also send out lantern slides and lend photographs of collections in our museum. The State of New York, through its department of individual instruction, lends all the photographs and lantern slides that may be needed.

"We have a lecture hall and will give lectures for the teachers and yet it is often perfectly useless to talk to them. Most of you have a great advantage over us, because science is taught in the schools and whatever you, in the museum, tell the teachers, you feel you are talking to persons who know something about the subject. A collection of teachers in the public schools rarely knows anything about art. If the art museum is to work with the schools we must have teachers who know something about art and possess a cultivated taste and a knowledge of style. We should also have a series of supervisors in the schools who shall teach the use of the museum, and until the public school system includes something of that sort it seems to me the only thing the art museum can do is to confine itself to a certain amount of pleasurable talk and lending of things. The real subject is open for the teachers of drawing, designing, and kindred subjects in the schools."

Mr. Wm. M. R. French (*Art Institute of Chicago*).—"The Association may be interested to know how the school teachers of Chicago became interested in the Art Institute last year. The teachers received credit upon accomplishing certain courses, and, through some inadvertence, the Art Institute was put upon the list. The teachers discovered that the courses given there were agreeable courses. Last year in January they began to attend the Saturday evening classes in great numbers. We have sometimes had nine hundred at work in an evening. More than 1600 taking actual lessons, passed their examinations, got the credit and nearly ruined the Board of Education. The Board of Education was obliged to strike us off the list. We hope our relation with the teachers will continue. They all know the Art Institute well now and they had a most beautiful time."

Miss. Alicia M. Zierden (*Division of Education, Pennsylvania State Museum, Harrisburg, Pa.*).—"We begin with the kindergarten and have exhibitions for elementary schools, normal schools and manual training schools. These collections, exhibiting the best work each year of the different schools and institutions, we keep open all the year round as an educational division. Aside from this, we have a lantern slide exhibition similar to the New York State institution. The slides are of various subjects and can be sent out to schools desiring them."

Miss. Delia I. Griffin (*Fairbanks Museum of Natural Science, St. Johnsbury, Vt.*).—"I cannot add very much to what I said two years ago at Pittsburgh. We are still carrying on the same work at the Fairbanks Museum. Perhaps we differ somewhat in the conduct of the class work. The children bring their own specimens and these are used for illustration of lectures given on various forms of plant life, etc. The children have obtained the specimens out of doors in the fields and woods and have gained interest in so doing.

"We have a large field in colonial material and we are beginning to interest the children in the life which their ancestors lived. We find that the children know so little of historical material that when we have shown a pair of snuffers and tray, they have immediately guessed that the instrument was used to clip fingernails with.

"We take the children on bird walks, and sometimes see twenty or thirty birds in one walk. The children get back in time for school. They used to start at six o'clock but we discovered that was too early for the children and now we start at seven.

"The flower table is, perhaps, one of the principal exhibits. The natural wild flowers are brought in and shown from early in the spring until late in the fall. The flowers are collected, to a large extent, by the children of the town, though the museum force obtains some of them. We began by showing one flower, the hepatica, and when that specimen was faded it was thrown away, but we now keep as many as we can on the table, each one labelled with its common and scientific name and the name of the child who brought it. About the time the County Fair was held, we had fifteen varieties of goldenrod. Some of the farmers came in and were much interested, for they did not know there were so many.

"One of the chief instruments in keeping the museum before the public is found in the weekly papers. We have a couple of weekly papers in the town, which are read through from the title to the last word, and we intend that no issue shall go out without something under 'Museum Notes.' It may be a column or five lines, but something there is, so the public shall know the museum is alive."

President Holland.—"My old friend Cameron had a new Presbyterian pastor introduced to him and he said, 'Young man, don't forget to keep yourself before the public. Don't forget it, it is an important part of your ministerial existence. Play ball, run to the fires, do something. If the newspapers speak well of you and praise you, fine. If the newspapers slight you, and speak abusingly that is not half bad, but if they neglect you, and say nothing at all, it is all up with you.'

"I am glad to know that the wisdom of one of our ancient politicians is being observed in modern New England."

Mr. S. R. Morse (*New Jersey State Museum*).—"Every year the best work done in our public schools is sent up to Trenton; not only from the public schools, but from the industrial schools and the farm school. This is done to encourage the children throughout the State to know that their best work will be shown in Trenton. At Jamestown I exhibited the work of the schools for the seven different expositions from 1876 down to the present time."

Mr. Baker.—"New Jersey is not ahead of Chicago. I had almost forgotten that I have in my pocket three examples of what the eighth grade is doing in bird compositions. Here they are. These were based on some of the bird talks I have mentioned and they are beautifully illustrated.

"I would like to ask a question about the loan collections. Do you send the birds out as skins or mounted specimens, and do the school teachers regard the mounted specimens as superior to the skins, and why?"

Mr. Rathmann.—"We have about 800 bird collections, which we send out in the course of a year. These all consist of mounted specimens, no skins. The teachers think the mounted bird far superior in appeal to the children. They are put in paste-board boxes and the museum man takes them to the schools. We get the birds back in fair condition. Every year we have to send out mounted birds and animals to the taxidermist, but we have been pleased to see what excellent care has been taken of them."

President Holland.—"I do not want the impression to go abroad among you that we, in our great city, have been neglectful of our duty in this matter. For many years we have been loaning bird collections in a glass case with a handle which can be carried. We also send out minerals, plants, and insects. There is a constant demand from the summer schools and playgrounds.

"In the matter of coöperation of the art schools in this work, I cannot understand what was said by our friend from the Metropolitan Museum of the advantage of science over art. In the state of Pennsylvania there is great attention paid to the instruction of teachers in the elements of art. There is a generation of young Americans coming forward, being instructed in the art of free-hand drawing and among them are many Raphaels and Michael Angelos."

The Association then proceeded to ballot for the election of officers for the ensuing year, with the following result:

President:

Frederic A. Lucas, Curator-in-Chief, Museums of Brooklyn Institute of Arts and Sciences, Brooklyn, New York.

Vice-president:

Frederick J. V. Skiff, Director, Field Museum of Natural History, Chicago, Illinois.

Second Vice-president:

Edward S. Morse, Director, Peabody Museum, Salem, Mass.

Secretary:

Paul M. Rea, Director, The Charleston Museum, Charleston, South Carolina.

Treasurer:

W. P. Wilson, Director, Philadelphia Museums, Philadelphia, Pennsylvania.

Councillors, 1909–1912*:*

W. J. Holland, Director, Carnegie Institute, Department of the Museum, Pittsburgh, Pennsylvania.

James E. Talmage, President, Deseret Museum, Salt Lake City, Utah.

The Association adjourned to inspect the Free Museum of Science and Art, and then to the Wistar Institute of Anatomy and Biology, where Dr. M. J. Greenman gave a paper and demonstration on "Some of the Most Recent Museum Instruments and Appliances," after which tea was served. The session was then adjourned.

SESSION OF WEDNESDAY, MAY 12

Evening

The Association convened at the School of Industrial Art, Vice-president Frederic A. Lucas in the chair. The first paper was presented by Mr. William M. R. French, director of the Art Institute of Chicago.

THE PLANNING AND FITTING OF EXHIBITION ROOMS, ESPECIALLY PICTURE GALLERIES

It is a singular and regrettable fact that when a museum building is built, the opinions of the director and his assistants are not always sought and followed. Often the museum director or librarian explains to his guest that he has had nothing to do with planning the building, and wishes many things were otherwise. Too often, considerations of external architecture prevail, and the exhibition rooms are resultant forms, instead of the predominant factors that they ought to be. A lively architect, talking upon the subject, said, "Why, of course the architect wants to make a fine architectural exterior. What is the use of regarding the people inside of the building? Think how few they are compared with the people outside!"

Perhaps the most common bad result of this principle is the production of deep, well-like galleries. More than forty years ago, when the building of the National Art Gallery in London was under discussion, the well-known art critic, Philip Gilbert Hamerton, proposed the construction of a wide area of one-story, skylighted galleries, and the erection of a handsome architectural screen or narrow building in front of them, a suggestion containing much good sense. Simplicity of plan is greatly to be desired, that is, such a disposition of rooms that the visitor may be able readily to grasp the arrangement and to know all the time where he is, as he passes through successive rooms. Such simplicity is by no means an easy thing to secure, and perhaps impossible in a large museum of many departments. The arrangement of the new Boston Art Museum in half a dozen distinct departments is a most interesting one. But few museums have numerous definite and well-developed departments, and the growth of departments is usually so uncertain and so dependent upon accidental opportunities and tastes, that in most cases the safest and most practicable policy is to build a sort of homogeneous building of well-lighted, well-related, and well-proportioned exhibition rooms, which may be appropriated by the departments according to their needs.

In skylighted areas it is highly desirable that the outer and inner lights be not very far apart, that is, that the outer skylights be not very high above the inner ceiling lights, so that the light will not have to enter through deep wells. This of course implies rather a flat roof.

The Romanesque and Gothic styles of architecture cannot well be employed for exhibition buildings, because they depend for their effects upon broad wall-spaces, high roofs, and windows with arches, mullions, and transoms, while exhibition buildings must sacrifice roofs to skylights and walls to large and unobstructed windows. Classic or Renaissance, or some modern modification of style must almost of necessity be adopted. A kind of depot or exposition construction is probably the cheapest, but unless it is treated merely as an outside shell, it is apt to lead to large, inhospitable exhibition rooms. In general, I regard very large rooms as undesirable, excepting for the exhibition of very large specimens, such as the extinct monsters and whales of the natural history museums, the boats and totem poles of the ethnological collections, and the architectural casts of the art museums. Rooms 200 by 80, and 50 or 60 feet high, are none too large for these, and such rooms give the architect proper motives for large central masses in his building. For other objects I think it rare that rooms larger than 60 or 80 by 35 or 45 feet are desirable, and not many such are needed. For the width of side-lighted rooms my observation would lead me to the opinion that about once and a half the height of the windows is as far back as can be satisfactorily lighted; and the windows should be square-headed. That is, if the window is 20 feet high from the floor, the room may be 30 feet wide. Of course you can light tolerably much farther back than this.

As an art museum man, I am naturally much affected by æsthetic considerations, and I believe the agreeable effect of moderate-sized galleries of varying dimensions, and, if possible, of varying heights, is too much overlooked. Let me enforce this idea, for it is what I had chiefly in mind when I undertook this paper. I believe that large, uniform galleries produce a weariness in the visitor, of the cause of which he is unconscious, while well-proportioned rooms of different shapes and sizes produce what somebody has well called a "sympathetic" effect, and encourage him to the study of the specimens and objects. This principle appears to have been observed in the new Boston Art Museum. A man making a cursory visit to a museum, after going down one side of a gallery 120 feet long, is reluctant to go back upon the other side. The proportions of rooms also are worthy of more study than they usually get. My observation is that skylighted picture galleries are apt to be made too high, perhaps because there is something seductive in the idea of loftiness. But modern practice with regard to the hanging of pictures is much improved, and we rarely hang more than two lines of pictures one above the other, for which 9 feet of vertical wall space above the "line," or about 12 feet from the floor, is ample. This, with the cove, gives height enough for galleries of 45 x 30 feet.

I am perhaps partial to our galleries of the Art Institute of Chicago. I have indeed met with few galleries as well adapted to their purposes, that is, as agreeable to the visitor, and as becoming to the pictures and objects of art. Of course this is partly due to suitable decoration, but greatly also, I am convinced, to the features of which I have been speaking, namely, justness of proportion and variety in the dimensions of the rooms, for which our architect, Mr. Charles A. Coolidge, should have full credit. The plans which accompany this paper show the two floors of the building. Though it is only lately that I have observed it definitely, it will be seen that in no case are there two similar rooms adjacent to each other. Excepting the great architectural sculpture room, Blackstone Hall (about 210 x 60 feet) and one other sculpture room (No. 3, which is 90 x 27 feet) there are no rooms larger than 50 x 40 feet. The picture galleries measuring 45 or 50 x 27 feet (Nos. 27, 32, 38, 42, 46, 48, 51, 53) are found a very convenient and tasteful type, and pictures always look well in them. In the main floor the large square windows are 16 feet high and the rooms, in accordance with the principle mentioned above, are 27 feet deep, except at the corners of the building, where they are 38 feet deep.

In our building the external roof is entirely of glass. In the sky-lighted rooms the ceiling lights extend over almost the whole room, the coves being kept very narrow, less than 2 feet in horizontal measurement in the smaller rooms, and less than 3 feet in the larger ones. These things we believe to be right, at least in our climate. It is much easier to shut out light, if excessive, than to add it, if deficient.

The color of floors can scarcely be too dark in a sky-lighted gallery. A black floor under a skylight often shows very light in a photograph. Some of our floors are of wood, which we stain occasionally with linseed oil and prussian blue; some are of mosaic of more or less dark colors, but our latest practice is to make the floor of cement, with a border about a foot wide of black marble, the marble being laid flush with the cement. The floor is covered, with the exception of the marble border, with dark cork carpet. Wooden floors, however, are decidedly preferable for galleries in which passing exhibitions of varied character are to be held, for two reasons: first, that picture frames, casts, and fragile objects are much less likely to be injured when set about on wooden floors than on cement or mosaic floors; and, second, that it is frequently desirable to attach pedestals, screens, and other constructions to the floors, which is not easily done on cement or mosaic.

With regard to walls, the dado or wainscoting is of black keen cement, the picture rail or "line" is of cement but has a nosing of wood, on which the pictures rest. Above the line the wall for 7 feet is lined with $1\frac{1}{8}$-inch wood ceiling laid close against the plaster, and above this there are vertical wooden strips 3 inches wide and $1\frac{1}{8}$ inches thick extending to the room cornice, 16 inches apart, the whole covered with cloth of red or gray-green tones. In spite of the traditional practice of providing horizontal strips, vertical strips in the wall are much better as a support for the hanging of pictures.

Undoubtedly the decoration of exhibition galleries of any kind should by very simple and quiet, although in art galleries it may be rich, if means permit.

Chairman Lucas.—"Mr. French's most interesting paper is before the Association for discussion."

Question.—"What is your preference as to color for walls?"

Mr. French.—"Some prefer gray-green walls for the Barbizon School, but for old masters my opinion is that the dull red is better. It was a foreign visitor, who used the expression, 'sympathetic galleries.' In Vienna, in the Royal Galleries, they have a turquoise wall. I did not like it. A little figure of two shades of the same color is good. Plush and velvet are good fabrics, when you can afford them. Mr. Ruskin says that buff, a strong color, is good. We have a few old masters and I hung them on a drab but they look horrible. You can make those old browns look like molasses, if you do not have contrasts."

Chairman Lucas.—"We will now pass to the consideration of the second paper, by Mr. Benjamin Ives Gilman, of the Museum of Fine Arts, Boston."

MUSEUMS OF ART AND THE CONSERVATION OF MONUMENTS

REGISTRY, STUDY, PUBLICITY

Conservation is the essential office of museums. Since antiquity, places where objects are permanently kept for public show have been called by this name. A museum is defined as a building devoted to the collection, preservation, and exhibition of works of nature or art, and in common usage the persons in charge are called curators or caretakers.

The need of concerted effort to care for instructive and beautiful objects outside museums has been felt and met only within the past century. Beginning with the French law of 1792 relating to the destruction or removal of historic or artistic treasures, the movement is now represented by a large body of similar measures in many countries; by territorial inventories—those of the German and other governments; by associations local and general—among others the Heimathschutz unions now multiplying in Germany, the National Trust in England, the Scenic and Historic Preservation Society in this country; and by national boards—among others the Italian Uffizi regionali per la Conservazione dei Monumenti, the French Commission des Monuments Historiques (1837), and the departmental commissions established in France under the law of April 24, 1906.

The purpose of this essay is to recommend to museums in America an extension of function, carrying with it the leadership of such a movement. The new office proposed to them is that of public information regarding outside objects germane to their purposes. Its possible scope includes all neighboring objects of public interest, whether instructive or beautiful, natural or artificial. The argument is here addressed directly to museums of art but offered also, *mutatis mutandis*, for the consideration of museums of natural science. Doubtless museums of history also might usefully supplement the efforts now making here and there throughout the country to preserve our memorials of antiquity.

Let American museums of art no longer confine their interest within their own walls. Let each take its neighborhood for its province, acquiring and imparting information about any local works of art, public or private, whose owners may offer them for the purpose. A knowledge of what we have is the necessary and often sufficient condition of its preservation, and museums may thus indirectly make the circle of their conservative activity complete.

Aside from certain conspicuous instances, the Hancock House in Boston, the l'Enfant plan of Washington and others, there has as yet been comparatively little occasion in America for efforts to protect our artistic inheritance. The occasion will surely come. Let it find the art museums of the country organized in defence of its artistic monuments. Let the museum of each locality become a rallying point for such a movement. Where no museums yet exist, let them be founded for this purpose only, until a building be needed as a new anchorage for such of their charges as are set adrift. Whatever a museum may accomplish in gathering and spreading information about the monuments of the region will be so much gained. Were the data all held in the drawer of a desk, time might easily make them priceless memorials.

Such a registry of local art may properly, easily, and advantageously be carried on by museums of art. Properly, because it is a work implying no responsibility beyond that of acquiring and giving information; and the information of the public on matters of fine art lies within the charter purposes of every museum. Easily, because every museum has already at its disposition for its own purposes an apparatus of registration, investigation, and exhibition, and a more or less numerous staff of persons competent to use it. Advantageously, because the conservation of monuments is a work of eternal vigilance better entrusted to the initiative of a permanent institution than to voluntary societies.

In a word, the present proposal makes the whole duty of museums of fine art one of watch and ward, and not ward alone as hitherto. Continuing as guardian of its own treasures only, the museum would be brought into relation as visitor with everything of like kind about it. More specifically the museum would undertake *to prepare and maintain an inventory of works of art outside its walls which are interesting and accessible to the public, and to promote the enjoyable and profitable study of them by all.*

In pursuance of this purpose the museum would schedule, investigate, and popularize any specimens of fine art in its neighborhood which the owners might offer and the museum think worthy. So registered they would be certified as available for public exhibition under conditions agreed on between the owner and the museum, the owner retaining entire control and the museum accepting no responsibility.

In detail the three duties of visitation would be the following:

1. The accurate or complete *registry*, by description, measurement, photography, and otherwise, of such buildings, monuments, paintings, sculptures, etc., in the locality as the museum might consider of public interest from an artistic point of view, and the owners might be willing to have treated in greater or less measure as public exhibits. The foremost class of such objects would be works of art belonging to the municipality, commonwealth, or nation, which doubtless should all be inventoried, however unequal their artistic merit. In the case of objects privately owned, the museum would wish to proceed carefully and with the advice of the best organized opinion in the city on the various arts.

2. The artistic and historical *study* of the specimens so scheduled. the accumulation of data about them and the artists, and the publication of results upon occasion. This study might lead at times to the recommendation of measures looking to the preservation of the scheduled objects and their utilization as works of art.

3. The management of the *exhibition* and exposition of registered objects to the public, either in place, or, in the case of movable objects, in the museum. The museum would undertake to aid the public in seeing registered objects intelligently by publishing lists or other accounts of them, organizing visits thereto, and in other ways; and in the case of works shown on private premises to provide such protective means, (custodians, etc.) as it would employ in its own galleries and grounds.

The visitation of public monuments as thus understood interferes with no existing agency for the promotion of art, but usefully supplements the work of all. Historical societies and unions for scenic preservation are founded in the interest of old association and natural beauty, not fine art. Art schools and leagues, village improvement societies, municipal art commissions and national art associations are all creative sources. What these achieve, the museum will help to conserve by making it known. The museum will be the means through which the country will take account and advantage of its artistic progress.

Where data are already complete and the facilities of exhibition ample, the museum will need only to record the fact in its registers. Doubtless municipal and professional archives exist, with whose aid a close copy of Independence Hall could be constructed were the original destroyed; doubtless also the building is publicly shown and commented upon as fully as practicable. But what photographs, technical descriptions, or historical documents now represent the lost Hunt frescoes in the Albany capitol? Do data exist, and where are they accessible, that would ensure to those who have never seen d'Angers' statue of Jefferson at the Capitol in Washington, a proper estimate of that work? Do sculptors generally even know of its existence? Plainly the record of our public artistic riches, to say nothing of the private collections occasionally shown publicly, is fragmentary and inaccessible, and most of it, moreover, is unauthoritative. So it might remain, however far the schemes now on foot for the preservation of antiquities and scenery and for the promotion of art were to be developed. The place of visitor to public monuments is empty for the museums of the country to fill.

Five good results might be anticipated from the acceptance by museums of this new duty:

1. The museum would be connected with current artistic production permanently and healthily. Always on the watch for any new and important acquisition of the neighborhood, it would fully record the origin, character, and purpose of the work before any of the facts were forgotten. Becoming interpreter and advocate of living art, the museum would nourish but not pamper it, winning but not granting it commissions.

2. The museum would appear in its true light as purely an agency of conservation, offering asylum to waifs and strays of art, but equally interested in the security of works still in their places. Zeal to preserve artistic treasures within gallery walls does not permit indifference to the fate of others without. To have no eyes for the present would be to impugn one's sense for the past, and conversely, to concern one's self with art still alive, is to deepen one's comprehension of its remains. A museum active on behalf of the monuments of its neighborhood acknowledges itself the refuge, not the home, of the objects of art it shelters.

3. Architecture, the third and chief of the material arts, would be brought within the circle of museum interests. Painting and sculpture alone (with their minor derivatives) can be represented in exhibition galleries by intact original works; architecture only by fragments or reproductions. A large share of the more important monuments of any neighborhood being works of architecture, the museum, by undertaking their registry and publicity, would complete its representation of the material arts. The architects on museum boards would find opportunities of service hitherto lacking.

Geology among the sciences presents on this point an analogy with architecture among the arts. By undertaking the registry and publicity of instructive natural features in their neighborhood, museums of science would for the first time represent geology otherwise than by fragments and reproductions.

4. The proposal adds to the present museum what might be called an out-door department. The Nordiska Museum in Stockholm has a park (Skansen) filled with examples of old Swedish architecture, which has been a successful adjunct to its indoor collections, and has found imitators. As visitor a museum would give and call attention to outside objects without waiting for their withdrawal from use.

5. The scheme would ensure to the museum a permanent source of enrichment. A probable result of the registry and publicity of outside objects under museum auspices would be their frequent transfer to the museum for permanent enjoyment by the public.

Finally, the plan should commend itself, first, to museums, because it offers the opportunity of a novel and important public service; second, to other owners of objects of art, because museum registry of a work would give it distinction, increase its influence and safeguard its future; and third, to the people at large, because the museum would henceforth be their representative, alert to see that all interesting and accessible works of art in their neighborhood should be utilized for public benefit.

Once more addressing museums of science, this essay recommends that the museums of America add to their function of collecting, preserving and exhibiting instructive or beautiful objects of nature or art the office of recording, studying and making known like objects in their neighborhood.

Chairman Lucas.—"Are there any remarks on Mr. Gilman's interesting paper? The City of New York is at present engaged in making a complete catalogue of all the paintings and statues—whether indoors or outdoors—owned by the city. It has had difficulty in getting track of some of its possessions, and finding the history of them."

Secretary Rea.—"I wish to testify to the suggestiveness of the ideas Mr. Gilman has put forth. I might mention in this connection two projects which the Charleston Museum is carrying out, and I would like to know if there are other museums doing the same thing. The Museum has discovered two colonies of the beautiful snowy heron on our coast. There is no other way of protecting them than for the Museum to lease or purchase the islands. Such an arrangement is now being negotiated, and I hope will be accomplished.

"My attention was called by a visiting botanist to the grave of Thomas Walter who was buried on his plantation on the Santee River. I found it an interesting place and the tombstone well preserved. Growing about the grave were plants perhaps planted by Walter or his descendants. I went down town and found the owners. I told them it meant a great deal to us to preserve such a place, and they told me that when they got a lawsuit off their hands in regard to the ownership, they would be glad to transfer it to us.

"I would like to know if other museums have considered doing anything of that sort."

Mr. George Francis Dow (Essex Institute, Salem, Mass.).—"At Salem the Institute has a curious glacial boulder, probably carried to its present resting place from a distance of several miles. We are holding this as a natural relic."

Dr. Miller (School of Industrial Art, Philadelphia).—"There can be no question as to the importance of Dr. Gilman's suggestions. It seems to me that the city, the state, the government itself should officially recognize the importance of such conservation as this and coöperate with every institution and association that is engaged in this work. There is enough for them all to do, but they are doing it in a disassociated, independent way."

Dr. Oliver C. Farrington (Field Museum of Natural History, Chicago, Ill.).—"I want to thank Dr. Gilman for his paper. He has very properly pointed out that it is often difficult if not impossible to transfer these objects to museums, and in many cases where artificial reproductions are attempted they have been failures. Some of us have seen in Crystal Palace Park in London, attempts to reproduce natural features. Dr. Gilman's excellent suggestion that the attention of museums can be directed to this feature of conservation can be carried out. To a certain extent photographs can be obtained. This we have done in Chicago. The old beaches in Chicago are rapidly disappearing, because they are being built upon, and the photographs preserve them to a certain degree."

Prof. William H. Goodyear, curator of fine arts in the Brooklyn Institute Museum, then presented the following paper:

THE DESIRABLE PROJECTION OF ART MUSEUMS AS SUGGESTED BY THE DESIRABLE CLASSIFICATION OF ART LIBRARIES

Introduction

Within the last few months a bequest amounting, with accrued interest, to some six thousand dollars became available for additions to the art department library of the Brooklyn Institute Museum.[1] Purchases for the art department library to the amount of some five thousand dollars (including expenses for periodicals and their binding) had been made under my advice since 1900, and the Museum had inherited, from the older Institute library, various important works on art which might add another one thousand dollars to the total library value.

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[1] The bequest of Samuel Bowne Duryea of Brooklyn was made in favor of the Brooklyn Art Association, whose trustees have placed the works purchased under the bequest in charge of the Museum of the Brooklyn Institute of Arts and Sciences.

The task which fell to me of suggesting purchases under the bequest naturally involved a survey of our previous acquisitions and the creation of such a classification as would make it possible to supplement and round out the art department library in a systematic and comprehensive manner, as far as a total sum of some twelve thousand dollars was concerned.

The question which I was led to consider was apparently this:

What selection of individual books should be made for a museum of art which is able to spend twelve thousand dollars on a library? There was evidently, however, another question underlying this one, viz: What classification of these books should be projected? If the new works were chosen without first creating a classification system, it would be impossible to balance up the new purchases, so that they might round out and supplement those which had been previously made. Former purchases had naturally been made from the standpoint of the needs of the curator for special collections and special studies at special times, and consequently could not be made from that systematic and comprehensive point of view which now became necessary. What was needed, therefore, was a classified bibliography of works on art, balanced for all topics and periods, and amounting in total value to the sum of about twelve thousand dollars.

The Museum enjoys the services of a most excellent and highly qualified librarian and this librarian had adopted and employed what is known as the Dewey system of classification. This, I believe, is the library system most widely adopted in the United States, and it is also said to be widely employed in Europe. Our library not only includes science, ethnology, and history, but it is, in other directions, a general library, as a result of inheriting the older Institute library, which was the original essence and visible beginning of the Brooklyn Institute of Arts and Sciences. The Dewey classification had been adopted for the general library, and its divisions for the art department had consequently been followed.

Thus it happened that a curator of fine arts was led to study the Dewey system, as far as it relates to art. The Dewey system is said to be an excellent system for the purpose of enabling a librarian to find rapidly the book which may be called for. Now I believe that the best system for such a practical purpose must always be the system with which a librarian is already familiar and that from this point of view no system is ever as good as the one which he has invented himself, because he naturally understands and remembers it a little better than any other.

The results of my examination of the Dewey system were as follows:

No art library should in future adopt the Dewey system.

No new art library could be projected or planned, as a systematic whole, on the Dewey system.

No one can tell from access to the shelves arranged on the Dewey system what an art library really possesses.

No one can properly supplement, or round out systematically, an art library already existing and arranged on the Dewey system, until a new classification of its present possessions has been made.

So far, the results of my research might appear to be of interest to librarians, rather than to museums, therefore I will now proceed to formulate another proposition, as follows: the natural and logical projection of an art museum should, in general terms and with obviously desirable and easily made modifications, be the same as the natural and logical projection of a classification for the books of an art museum or of an art department library. So, if we inquire what the arrangement of such a library ought to be, we are, as far as my views are concerned, stating also what the general arrangement and general plan of an ideal art museum ought to be.

We are led immediately by such a proposition to examine the following vastly important questions:

How far must the ideal museum of art history admit deficiencies which only books can supply?

How far can an existing museum supplement by illustration,—possibly casts, possibly photographs, possibly plate publications,—such deficiencies as might not exist in an ideal museum, but which are certain to occur in all real museums, however relatively ideal they may be? Therefore, while I am ostensibly speaking of a bibliography of books to cost about twelve thousand dollars, and while I am ostensibly speaking of a desirable classification for such books, I conceive myself to be actually speaking of the ideal arrangement and projection of the ideal art museum and of commendable partial arrangements for the actual museum, which can never strive to be better, unless it has a plan, and unless it realizes and announces its own deficiencies.

THE DEWEY SYSTEM

Descending for a moment from the high plane of theoretical propositions and plans to the lower but more convincing plane of actual experience, allow me to offer some illustrations of the deficiencies of the Dewey system.

I had asked our librarian for a list of books in the art department library. This list was duly furnished. Some months later, when I began to examine the list, various books occurred to me as having been purchased, which did not appear in the list. On inquiry it turned out that they had been unintentionally omitted. The reason was that such books had been classified under "archæology" or "travel" and not under "fine arts." Now a book which is classified under "archæology" or "travel" on the Dewey system cannot be classified under architecture, sculpture, painting or even under the general history of art.

Properly speaking, it is manifest that the term "archæology" includes all architecture, all sculpture, all painting and all other arts of all the ancient oriental, and classic, nations. Although, when mediæval studies are in question, we are more likely to use the term "antiquarian" than the term "archæologist," the term "Christian archæology" is also not only defensible, but it is actually the sub-title of a very excellent book on the subject of early Christian art. It is evident therefore, that the term "archæology," as properly and generally used, overlaps and includes so many subjects that it is indefensible as a general heading in classification. The term (when used in its proper sense) never ought to be admitted into the major headings of a classification. For, in the accepted sense of the term, Pompeiian paintings are archæology, while Renaissance paintings are not archæology. In the accepted sense of the term, Greek sculpture is archæology, Renaissance sculpture is not archæology. But even Greek sculpture is not archæology on the Dewey system. Even Pompeiian paintings are not archæology on the Dewey system. As a major heading, therefore, the term history of art should replace the term archæology.

In the Dewey system, "archæology" practically includes anything the librarian chooses to put into it which does not visibly and distinctly belong to some other art classification. It is the limbo of books that are not distinctly to be put somewhere else; but the books which distinctly ought to be put somewhere else in the Dewey system, really belong to archæology. In the Dewey system archæology is theoretically *a subdivision of biology*. We are saddened by the thought that logic does not rule the Dewey system, because sculpture and painting and architecture, although they are undoubtedly archæology for the ancient periods, and even for the early Christian, are not found under "biology." On closer study we find that the Dewey system theoretically confines archæology in the large sense to prehistorics, but the unfortunate librarian very naturally puts the Revue Archæologique, which rarely publishes anything prehistoric, and the American Journal of Archæology, which is almost wholly confined to classic art, on the same shelves with Lubbock and Tyler.

However, under "geography and travel" we find a subheading for the "antiquities and archæology of individual nations." Thus things pertaining to "excavations" go under a subheading of "geography and travel." The Dewey system seems to take it for granted that excavations have nothing to do with architecture, sculpture, or painting, and that anything which is not very popular may as well go under archæology as anywhere else. Devotees of the Dewey system are not encouraged to ascertain the fact that books on excavations might possibly relate to the general history of art and go under it in their proper subdivision.

Next to the inspiration which places "archæology" under "biology," I note the insertion of "landscape gardening" between general works on the fine arts, on the one side, and special works on architecture, sculpture and painting on the other. I discovered this feature of the classification by accident. In looking over the new shelves for the works on Japanese art, I naturally supposed that they were placed together and that what I saw on the given shelves was all we had. My eyes fell on Professor Morse's "Japanese Homes and their Surroundings," and it occurred to me that we had a book by the well-known architect, Mr. Ralph Adams Cram, on "Japanese Architecture and Related Arts," which did not appear on the shelves. I asked for the book and was told that it was in the library and properly shelved, but that the Dewey system required it to be placed with general works on the fine arts. It was shown me at some distance away. I then noticed a large number of books on landscape gardening to be intervening, and I found that the Dewey system ordered things in this fashion.

As another illustration of the Dewey system, I will say that a book relating to Egypt may be catalogued and shelved under ' fine arts" in general; it may be under "architecture," "sculpture," or "painting," or it may be under "archæology" or under "travel." The latter I found to be an extremely attractive shelf division. Any one who has told us something about the archæology of Egypt, who has been so unfortunate as to travel, is very apt to find his books under that general and inspiring division of scientific knowledge.

It may be added here that I wish everything which I have said about the Dewey system to be taken in a purely Pickwickian sense as far as Mr. Dewey is concerned. I have met Mr. Dewey personally and found him a charming companion. I have no doubt that he employed an expert to do this part of the work for him, and I think it quite likely that this expert will never reap his full reward.

Is there anything better than the Dewey system? There must be something better because nothing could be worse. Hence I offer, with great confidence, my own system as being something better, and there is this to be said in its favor: it is not at present a theoretical system. It is a system which has, in practical use, offered a convenient working classification for twelve thousand dollars' worth of books. The test of a classification is that it does not leave one in doubt where to place an object or a book, as the result of overlapping categories. The system in question has been used for a card catalogue representing every work mentioned in the bibliography, whether already owned, or not owned, and desired as a purchase. My personal experience is that after this classification was drawn up, all these cards, representing as many works, were distributed as fast as hands and eyes could work.

This system is, therefore, not a theoretical classification. It works in practice. A scholar, who looked over the classification, remarked that it seemed a good one, but that a subheading for "utensils," had been forgotten under antiquity. I pointed out that there are no extant books on ancient utensils, although there are some which embrace this subject with many others. Hence this is a matter for cross-references in a topical catalogue, but not a proper heading for a book classification. This point is mentioned as an instance of the difference between a practical and a theoretical classification of books, also as indicating the many manifest and necessary discrepancies between a classification of books and a classification of museum material.

Another instance of the difference between a theoretical and a practical classification of books is instanced by the absence of a heading for "glass" under Greek art, although such a heading is found under Roman art. This is not because there is no ancient Greek glass but because there is no special book on the subject—the finds never having been sufficiently numerous to warrant a book.

One point in passing, as to the practical use of the proposed classification in libraries which have already introduced the Dewey system, or some other system which may possibly be inferior to the one proposed. The reclassification of a library which is already well under way, is probably impossible in most cases. No librarian will assume such a burden, which involves the renumbering and redistribution of a card catalogue which has required several years for its building up.

For such cases it may be pointed out that a good topical classification by a special card catalogue is always to be desired. The classification now proposed will always be available for the making of a topical card catalogue, and will be of most use, in such cases, to the libraries which are now using the worst system and which are obliged to retain it. Such a topical catalogue becomes necessary as soon as the shelves themselves do not show together the books which belong together.

If it be suggested, on the other hand, that a good topical card catalogue makes it a matter of no concern as to what shelf arrangement be adopted, and that the Dewey system is as good as any, provided a good topical card catalogue be accessible, I can only answer that such a good topical catalogue, outside of my own, is not yet extant in proper classification for scholars' use, to my knowledge. Moreover, all scholars who use a library prefer to go directly to the shelves, and consequently prefer to have books which belong together, kept together. They can learn much more rapidly from the shelves, than they can from a card catalogue, what a library possesses in a given field, and they can test the value of a book previously unknown to them much more rapidly by taking it down, than they can by calling for it through a card catalogue.

Having thus disposed of some possible indifference to the proposed classification, which indifference will inevitably affect those persons who may suppose that they are called upon to upset and revise an already established system in an already existing library, we come to the classification itself, as presented below.

THE PROPOSED SYSTEM

COMPENDIUMS AND WORKS OF REFERENCE

- BIBLIOGRAPHIES
  - ENCYCLOPÆDIAS AND DICTIONARIES OF ART AND ARCHITECTURE
    - MUSEUM HANDBOOKS CLASSIFIED BY CITIES IN ALPHABETIC ORDER
- SETS OF HANDBOOKS
  - Bibliothéque de l'Enseignement des Beaux-Arts; Artists' biographies in series; Sets of miscellaneous popular summaries of Industrial and Decorative Art. Handbooks of Travel for Art Students. General Works of Travel for Art Students (countries in alphabetic order, cities in alphabetic order)
- GUIDES AND HANDBOOKS OF TRAVEL
- GENERAL HISTORIES OF ART
  - General Histories of Architecture; General Histories of Sculpture; General Histories of Painting; General Histories of Industrial Art; General Histories of Ornament

HISTORY OF ART. ANTIQUITY

GENERAL HISTORIES OF ANCIENT ART

EGYPT

Popular introductory works to Egyptology; Cairo Museum; Official publications on excavations by authorities of the Cairo Museum; Folio plate publications in order of appearance; Egyptian Exploration Fund; Egyptian Research Account; Prehistoric and early Dynasties; Other Recent Excavations; Architecture; Archæology; Manners and Customs; Pottery; Textiles; Ornament; Scarabs; Religion; Mythology; Papyri; Hieroglyphs; Records and Inscriptions; Coptic period; Arabic period; Modern period; Political and Social History

ASSYRO-CHALDÆA

Chaldæa; Assyria; Persia; Hittite Mesopotamia; Asia Minor

SYRIA AND PHŒNICIA

ÆGEAN AND EARLY MEDITERRANEAN ART

Cyprus; Crete; Mycenæ

GREECE

Topography and Travel; Monumental plate publications; Architecture; Ornament; General Art Histories; Sculpture; Terracottas; Pottery; Coins and Gems; Antiquities and Archæology; Æsthetics and Criticism; History, political and social

ITALY AND ROME

Prehistoric and Bronze Age; Etruria; Rome (the city); Pompeii; The Empire; Architecture; Art and Archæology; Coins and Gems; Glass; History, political and social

HISTORY OF ART. MEDIÆVAL PERIOD

MEDIÆVAL HISTORY, CULTURE and CIVILIZATION

PREHISTORIC AND BRONZE AGE. General works, as introduction to Mediæval Art

PREHISTORIC AND BRONZE AGE IN NORTHERN EUROPE

Including early Roman influence in Northern Europe, and including early Christian influence in Britain

Spain; Germany; Gaul; Britain; Scandinavia; Russia

BYZANTINE AND SARACENIC ART

Byzantine art, general histories; Saracenic art, general histories, Persia; Syria; Asia Minor; Constantinople; Cairo and Mohammedan North Africa; Mohammedan Spain

EARLY CHRISTIAN AND MEDIÆVAL ROME

General; The Catacombs; Mediæval ivories; Mediæval miniatures

MEDIÆVAL ARCHITECTURE

Plate publications, general; Books, general; Italy, plate publications; Italy, books; Germany and France, plate publications; Germany and France, books; Great Britain, plate publications; Great Britain, books; Spain; Scandinavia; Russia

Mediæval Art
Iconography; Sculpture; Industrial and Decorative Art; Mosaics; Painting
General Histories of Art, including Renaissance and Modern Art

HISTORY OF ART. THE RENAISSANCE AND MODERN PERIOD

Renaissance Culture History and Biography
General Renaissance Art Histories
Including the Mediæval period
Renaissance Art, General Works
Excluding the Mediæval period

Renaissance Architecture. Plate Publications
Renaissance architecture, books, exclusive of plate publications:
Italy; Spain; France; Germany; Great Britain

Renaissance Sculpture
Related Biographies
Italian Painting
General works; Special and critical works; Biographies of artists
Spanish Painting
General works; Biographies

German, Flemish and Dutch Painting
General works; Special and critical works; Biographies; Etching and Engraving

English Painting. Historic and Modern
General works; Special Biographies
American Painting. Historic and Modern
French Painting. Historic and Modern
General works; Special Biographies
Modern Painting. General works
Modern Etching and Engraving
Modern Architecture
Modern Sculpture

MODERN INDUSTRIAL AND DECORATIVE ART

Critical and educational: Special histories; Furniture; Metals; Plate; Ceramics; Textiles; Lace; Costume; Ornament

CRITICISM AND PHILOSOPHY OF ART

Historic Art: Architecture; Sculpture; Painting; Ornament; Æsthetics; Miscellanies

TECHNICAL INSTRUCTION

COINS

ANCIENT, with cross references to Greek and Roman
MEDIÆVAL AND MODERN ORIENTAL

ORIENTAL ART AND ARCHITECTURE

PERSIA CENTRAL ASIA INDIA
CHINA AND JAPAN, Collective CHINA Ceramics, Miscellanies
JAPAN, Ceramics and Cloisonné, Miscellanies

PRIMITIVE AND SAVAGE DECORATIVE ART

PERIODICALS

SUB-HEADINGS BY COUNTRIES IN ALPHABETIC ORDER.

Subdivisions by Territories according to geographic contiguity and sequence of evolution.

AMERICAN ARCHITECTURE AND FINE ARTS; AMERICAN ARCHÆOLOGY; FOREIGN ARCHITECTURE AND FINE ARTS; FOREIGN ARCHÆOLOGY

REPORTS OF SOCIETIES

Alphabetic arrangement by cities.

Within any given sub-heading the arrangement now followed in the Brooklyn card bibliography, is by authors, arranged in alphabetic order, but the use of a decimal numbering system is undoubtedly to be recommended. In this direction, suggestions (not as to the choice and arrangement of numbers, but as to the method of employing decimal numbers) may be taken from the Dewey, or Cutter, systems, to great advantage. I am inclined to suggest an alphabetic lettering for the major headings (large capitals); a numbering by hundreds for the headings under major headings (small capitals); and units for the subdivisions under sub-headings (upper and lower case type). For individual books under a subdivision, I should suggest the use of the Cutter table of book numbers. Thus Miss Edwards' "Pharaohs, Fellahs, and Explorers" would be numbered B 101 E 95 p— the number being obtained as follows: HISTORY OF ART, ANTIQUITY = B. EGYPT = B 100; Popular Introductory works to Egyptology = B 101; Author and title = E 95 p— of the Cutter table.

Let us consider this classification not only as a plan designed for libraries but also, with some manifest limitation, as a projected plan for an art museum, with special reference to those features which an ideal museum may possibly cover, and also with special reference to those features which an ideal museum cannot possibly cover. By such a procedure we shall not only clarify our views as to the desirable projection of an ideal art museum, but we shall also rise to a conception of the vast importance of the knowledge to be obtained from libraries, as a background absolutely necessary to fill up the scheme of any good art museum. We shall learn, besides, as regards the projection of new museums, or the filling up of the deficiencies of old ones, to consider in what departments photographs or casts have mainly to be considered.

DIVISION BY PERIODS, AS OPPOSED TO A DIVISION BY SEPARATE ARTS

Passing by the inevitable first place for books of reference in the narrow sense, such as bibliographies and dictionaries, the latter being arranged in order of period and then in the natural order of the special arts, we reach next the natural and logical preliminary divisions of an art library; the divisions for general histories of art and for general histories of architecture, sculpture, painting and ornament.

It will be observed that there are no distinct general divisions beyond this point, as there are under the Dewey system, for architecture, sculpture, and painting. These subjects are not admitted at all as the basis of main divisions in classification, which is, on the contrary, outside of the far East, first arranged by periods and then by territories under these periods. Thus the special arts are grouped together, not only by the larger periods, but also by territories. That an ideal museum should be classified by periods and not by the divisions of architecture, sculpture, and painting is to my mind so obvious as to be hardly debatable. But it will not be so immediately obvious to a layman perhaps, until our libraries are classified on the same system.

Here again the special subject of library classification has vast importance for those points of view which ought to filter insensibly into the conscience of the general cultivated public and which ought not to be fought over and battled for by scholars and experts, when they are really elementary propositions, which ought not to be debatable.

In an ideal general museum, Egyptian architecture, sculpture and painting should go together, with all other Egyptian arts and relics. This is plain common sense, and the same point holds for classic antiquity in general. Both periods should be separated throughout from mediæval, and all should be separate from Renaissance. The contrary arrangement is against common sense, whether in books or in museums. Neither ancient nor mediæval sculpture should be separated in study from the related and contemporary architecture. Neither can Italian painting, in its most important productions, be separated from architecture. As for the minor arts like those of ceramics, glass, ivories, etc., it is absurd to destroy the atmosphere which ought to envelop and inspire them, by ignoring periods and considering only the crude material of which they fortuitously consist.

But if this be true of art museums, it should hold true also of books, which are the background and scaffolding of all our knowledge of the subject. When our libraries are properly arranged we shall better understand what art museums are for. This is, at present, occasionally a debated question. But inasmuch as the proposition that a division by periods is preferable to division by separate arts, is not so immediately obvious for books, it will now be debated for books.

The objections to arranging books under the headings of architecture, sculpture and painting, instead of arranging these arts by periods, are really crushing, when considered by an expert. These objections move first from the constant and inevitable overlapping of topics in one book. Individual art objects naturally never overlap, but books inevitably do. If you have a bad classification for museum material, you are still able to stick to it. But if you have a bad classification for books, you cannot even stick to it. The bad classification for books is the one which allows them to overlap in categories, as they inevitably overlap in fact. Take for instance "excavations." These may include, and constantly do include architecture, sculpture, painting, ceramics, and every possible variety of objects. The recent excavations in Crete are a notable example; excavations in Egypt are another; excavations at Pompeii are another; excavations at Olympia are another. Now under the Dewey system these go under "antiquities and archæology of special countries," and this is a branch of "geography and travel." Hence they are removed by all the subdivisions for literature from their legitimate position under the general history of art. As a matter of fact they have no legitimate position. The arrangement is a makeshift, unworthy even of criticism. If I wish to study the plan of a temple at Naukratis, unearthed by Petrie, I go to "geography and travel." If I wish to study Petrie's book on the pyramids, I go on the other hand to "architecture," but I do not, in either case, go to Egypt. What monumental obscurity! The instance of separating "Japanese Homes and their Surroundings," by Morse, from "Japanese Architecture and Allied Arts," by Cram, is duplicated whenever a work on excavations is catalogued by the Dewey system.

Take another instance of the difficulties of arranging works under the divisions of architecture, sculpture, and painting. Many of the most splendid folio plate publications on Mediæval architecture include sculpture, painting, stained glass, and furniture. Why should these books be separated from the photogravures of the Mediæval casts of sculpture in the Trocadero, which are architectural without exception, but which, notwithstanding, go under sculpture and not under architecture.

The absurdity of placing special works on Renaissance sculpture under the same category with Greek sculpture is another phase of this confusion. The student of Renaissance sculpture is naturally interested in Renaissance culture, Renaissance architecture, and Renaissance painting. The related books should be associated by periods, not by divisions which obscure the knowledge of periods. This arrangement is not only theoretically better but it is practically workable, as fast as one can distribute and handle the books and the catalogue cards.

For a general museum expert the proposition that Greek pottery should be classified, on general principles, with other forms of Greek art, rather than with Italian majolica and modern china, needs no special plea, and what holds of museums holds to an even greater degree where books are concerned.

It may be said, as an aside, that I should have as little objection to a modest synoptic museum collection of ceramics as I have to a book on modern ceramics which includes a mention of Greek pottery, but it is clear that no general book on modern ceramics can do justice to Greek vases and it is equally clear that, in a general museum, no important collection of Greek vases should be associated with an important collection of Italian majolica.

A few more words may now be devoted to the question whether museum and art libraries should be projected under the divisions for the main periods of art history, viz: under Ancient, Mediæval, Renaissance and Modern; although to my mind the subject is hardly debatable.

If this arrangement be desirable, it becomes evident that the museums of the future must give much attention to the subject of casts and photographs, and I will add that they must give much attention also to the subject of books and especially of folio plate publications. For instance, miscellaneous collections of the minor classes of Egyptian antiquities may be obtainable for some time to come, but are not the great folio plate publications for Egypt an indispensable adjunct to every museum which can afford to buy them? There could be no greater boon to the general public than to frame up for public exhibition the folio color plates of Prisse d'Avennes. A public exhibition of large photographs of Egyptian pyramids, temples, and statues, appears to be desirable in every general museum, as well as the exhibition of the easily obtainable but not very numerous casts and squeezes of Egyptian material which can be had from Cairo and the British Museum.

Just as the library of an art museum or department should be rounded out, as far as possible, in a manner wholly independent of the museum's actual exhibits of original material, so an ideal general art museum should round out its possessions and fill up its necessary gaps by casts and by photographs. I can see no hope for the future student of art history unless this be done and I have very little respect for an art criticism which does not rest on historic foundations, and which is not inspired by historic principles.

We will pass now from the matter of the large divisions by general periods, to the questions connected with the arrangement by territories within those periods, and first of all to the question as to *what territories should be excluded* from an arrangement under periods.

CLASSIFICATION FOR INDIA, CHINA, AND JAPAN

In these days of evolution theories and evolution tendencies there can be no debate as to the point that the order of evolution must be considered in formulating a classification, either for an art museum or for an art library. Hence those territories or exhibits have first to be considered which do not adapt themselves to an evolutionary arrangement, for whatever reason it may be, and that reason will generally be our own ignorance, due to gaps in the record, which may be compared to the gaps and breaks in the record presented by the strata of geology.

In an art library and in an art museum the first problem of arrangement and of classification, is that which deals with the disposition to be made of the far East, viz: India, China, and Japan. These territories are outside of the sequence of European evolution and as to their own evolution we have in the case of India and of China no material and very little reliable record. Manifestly then, these territories must come either at the end or at the beginning of a library classification, in order not to break the sequence which can be established for all other territories of Western Asia and of Europe.

Which shall it be for India, China, and Japan; end, or beginning? For a museum it might appear to be a matter of indifference; supposing that its galleries could be arranged in physical sequence, which is not always possible. For a library it is not at all a matter of indifference. The logical arrangement of territories in a definite sequence is as important as the logical arrangement of periods. The movement of civilization is always by contiguity and the movement has generally taken place in what may be called a sequence of contiguity.

What now are the facts regarding Hindoo art as known to us? The facts are, that India's art has always been bastard, and never has been independent. Neither has Indian art or architecture any high antiquity as known to us. 300 B.C. is about as high as we can go in dates. There are absolutely no very ancient temples in India, much as the contrary has been suggested. Buddhist art starts, as we know it, under Greek influence, dating from Alexander the Great's campaign and the states near the Hindoo borders founded by his generals. There was, of course, an earlier art, but such as there was appears to have been under Assyrian or Persian influence. Later Indian art is Mohammedan Saracenic, and Mohammedan Saracenic is, in origin, Byzantine.

Now it is absurd to study the art of a nation which has always been derivative, before we have studied the art from which it was derivative. Thus, as between the beginning or the end of a classification, India goes to the end, and certainly should not go at the beginning. If introduced at any intermediate point India breaks a sequence. China and Japan should come after India, not because much of their art is not independent of India, but because much of it *is* dependent on India, whereas the reverse does not hold. Of course, there can be no debate about putting Japan after China, in a question of evolutionary sequence. Thus the far East is disposed of. It comes last in our classification.

THE ARRANGEMENT OF TERRITORIES FOR THE ANCIENT PERIOD

In the Dewey system for fine arts history in general, China comes first; Egypt, second; Judea, third; India, fourth; Chaldea, Assyria, and Persia, fifth; Rome, sixth; Greece after Rome; and then the modern countries. There is absolutely no logic in such an arrangement, no logic in the knowledge which inspired it and no logical knowledge obtainable from it. In explaining my own arrangements of territories, the defects of this Dewey arrangement will further appear.

The classification advocated does not call for a special division for prehistorics. The prehistoric art and bronze age art is called for by territories, wherever it appears in finds and has been treated by books. In very recent years a prehistoric period of great interest is known in Egypt. For Egypt the books on prehistoric finds come last, because these excavations are most recent. No one can study Egyptian art by beginning where science and archæology have ended. Otherwise, omitting the Tigris-Euphrates valley, Syria and Greece, where no bronze age art is known, up to date,[1] we next enter the topic under Italy, where our first real knowledge of this art begins and where the insensible transition from the bronze age to the later art can first be studied. The sequence from bronze age art to Greek influence is much earlier in Italy than in the territories of Europe farther north and west.

The point of view in avoiding a special division for prehistoric and bronze age art, and in treating it by territories, is that prehistoric art in Europe merges into bronze age art insensibly and without sharp demarcation. Now the earliest bronze age art which is known by large masses of material, that of Italy, shows east Mediterranean influence, and no north European bronze age art is known which does not show barbaric adaptations of Greek art, through Etruscan or other Italic mediation. Consequently I hold it to be illogical to study bronze age art before these influences have been considered. This is my explanation for not putting prehistorics before Egypt. As for entering prehistorics under special territories, outside of Egypt, before Italy comes on the stage, my objection is that a classification should never be theoretic.

As an instance of theoretic classification I have noticed in an expansion of the Dewey system for architecture which has been published by a Western University, a classification of Syrian territories in which there is an entry for the Philistines. It can only be said of such a classification that any library which possesses a book on Philistine architecture (in the territorial sense) should immediately make the fact known, and that any archæologist who can mention a single remnant of Philistine architecture will become instantly famous.

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[1] We must distinguish here between the use of bronze which was well known in Greece and the so-called "bronze age" art. The Dipylon period of pottery undoubtedly represents such a period, but the finds of metal from this period, in Greece, are, so far, infinitesimal. Bronze finds are fairly numerous in Crete, but they do not show the "bronze age" art.

To return to Egypt, we have only one more point to make. Within the last few years dates are being established for the Tigris-Euphrates valley culture, which have an antiquity possibly as high as that accepted for Egypt and possibly higher. Is it not therefore a matter of indifference whether Chaldea precedes Egypt, or the contrary, or would not logic compel us to reverse the arrangement which places Egypt first, if higher dates were positively established for Chaldea? The answer to this question involves an explanation of the point of view from which the territories have been arranged under given periods, throughout this classification.

Under the general facts of history, and these are naturally the general facts for the history of art, we are dealing under the various terms of Chaldea, Assyria, and Persia with only one culture, and that is the culture of the Tigris-Euphrates valley. Different military ascendancies under different names, according to the province which assumed the leadership, are found at different times in the Tigris-Euphrates valley, but the culture sequence is uninterrupted, until ultimately the Egyptian influence spreads by way of Syria and overlays and saturates the Tigris-Euphrates culture. This overlay and saturation begin to be apparent in the Assyrian period, but are more especially evident in the Persian period, until the Greek influence takes its place.

Thus, in the sequence of art history and of culture, we should place first the Egyptian culture, because it ultimately overlaid the Assyrian. Otherwise we study Assyria with the disadvantage of not knowing Egypt; a disadvantage, because Assyrian art was largely bastard Egyptian through Phœnician transmission.

As Phoenicia was the connecting link geographically, and therefore historically, between Egypt and the Tigris-Euphrates valley, we need no argument for the location given to Phœnicia in our system. No position can be given it, excepting that of intermediary; for Phoenicia had absolutely no independent art. The intermediary must logically come after both the cultures which it joined and united.

Equally clear is it that the Ægean and early Mediterranean cultures of Cyprus, Crete, and Mycenae are here arrayed in their logical order. They connected Phoenicia with Greece and, as far as their own arrangement is concerned, the order represents their own sequence of relation, the sequence which naturally would hold geographically and which actually did hold historically; the sequence from East to West, which was also a sequence in time, as regards beginnings.

The absurdity of the Dewey arrangement in placing Rome before Greece is palpable—we have only to consider that the expansion of Roman power over Italy did not even begin until the time of the downfall of the Greek states, under Philip of Macedon, and that the later history of the culture of Italy, of Rome, and of the Empire of Rome, is the history of the diffusion of Greek art and influence over western Europe. Moreover the earlier history of Etruscan and other Italic art is the history of Greek influence. We do not know any Etruscan art, even the most archaic, which is not Greek in derivation, or, at least, in influence. To place Rome before Greece is to be absolutely out of the sequence of evolution. In an art museum it would be ridiculous to invert their relations. In a library it is not less so.

ARRANGEMENT OF TERRITORIES FOR THE MEDIAEVAL PERIOD

In the classification for the Mediæval period there are arrangements of territories which may not be immediately obvious to a layman as the logical arrangement, but which defend themselves as soon as they are briefly explained.

Historically speaking the Mediæval period represents the contact of the Germanic and Celtic races with Greco-Roman civilization, and their gradual assimilation of this civilization, with those remarkable differences of form and spirit, which partly their own independent racial traits, and partly their own originally ruder development, in the order of time, made necessary and inevitable.

That the background of Germanic and Celtic culture was that of a stone age culture, gradually modified by a bronze age culture which moved up from the south, is demonstrated by the history of art. Therefore the history of art should be so arranged as to illustrate this sequence, whether in books or in museums.

No excuse is therefore needed for beginning the classification for the Mediæval period with a preliminary section for prehistoric and bronze age art. The arrangement of individual territories is naturally that of their appearance in order of time in bronze age culture.

The bronze age culture of the Swiss lake dwellers has been until recently the earliest known in northern Europe. This would give Germany first place in the classification. Without debating questions of precedence in time, as compared with Spain, the best arrangement will place Spain first on account of her relations to the cultures of Mycenæ and Crete. If Germany is given second place in the classification, the arrangement should then be, according to sequence of time, Gaul, Britain, Scandinavia, Russia.

Having thus established an independent Northern foundation for the Middle Ages, we turn back to the Byzantine and Saracenic cultures, which must be disposed of before the Middle Ages, in the narrower sense which applies to western Europe, can be considered. For Mediæval culture history is that of a gradual saturation by the ancient Mediterranean culture; partly by the local survivals of Roman culture in the West; partly by Byzantine East Roman influence, and in a less degree by Arab Saracenic influence, which was in origin also Byzantine, but which to some extent moved through Spain.

All Arabian and Saracenic art is an offshoot of the Byzantine Greco-Roman, and it first developed in the Byzantine territories of Syria, Egypt and North Africa, after the Arabs conquered them. In the library classification we therefore place first the general works on Byzantine art, and then those on Saracenic art.

In the arrangement of territories we observe the sequence: Persia, Syria, Asia Minor, Constantinople, Egypt, North Africa, and Spain, as being much the most convenient and logical.

We are now able to take up the direct sequence of Mediæval art as it began in the catacombs and in early Christian Rome and Italy.

IVORIES AND MINIATURES

The ivories follow immediately, because they are the most important connecting link between Pagan and Christian art. The reasons are obvious. In the late decadence of Pagan-Roman art, ivory carving was the art most practiced and the best design survived there. Therefore, in the beginning of Christian art, ivory carving shows the best design. Next, the ivory carvings, being portable, were most easily concealed from the cupidity of barbarian ravages. Moreover, their material was not tempting to these ravages. They could not be melted up like metals. Thus the ivories were not only the best art but they were also the most easily preserved. For this reason, as far as survivals go, they are the main surviving connecting link between Pagan and Christian art.

Next in order we place the miniatures, both of Byzantine and of early Irish art, since, west of Byzantium, Ireland was the only territory not overflowed by the German invasions, and therefore was the main refuge of West Roman culture in the 5th, 6th, and 7th centuries. Ireland was spared from barbarian degradation until the 10th century and the inroads of the Northmen.

The later arrangement of the Mediæval classification need hardly detain us, but the arrangement of territories for the history of architecture is not that of the Dewey system. In the order of time Italy is first, Germany second, France third; then come, side by side, Spain and Great Britain. Therefore we also place them in this order territorially.

PAINTING

The reasons for placing the general histories of painting at the close of the Mediæval period or at the beginning of the Renaissance, are obvious. All histories of painting unite the two periods. If placed last under the Middle Ages or first under the Renaissance, we are not obliged to duplicate mention or references.

The later subdivisions for the Renaissance and modern period need hardly detain us, as long as large and general points of view are controlling.

COINS

It will be observed that Coins have a major heading and a department of their own. They form an exception to the usual standpoint of my classification. The reasons are easily given, but space is lacking here. An exception is made, however, for Greece and Rome which will involve cross references and duplicate carding.

GENERAL CONSIDERATIONS

We are now able to return to some general considerations. Is this scheme too ambitious? For a library classification, it certainly is not. Anything less comprehensive would be open to instant and incessant criticism.

Is this scheme too ambitious for a museum? In principle, certainly not. In practice, no museum, of course, can even attempt to cover the whole architectural field in casts. Only one museum in the world—the Trocadéro in Paris—has attempted this in a large sense, even for Mediæval architecture. But should not a museum, for that very reason, pay the more attention to photographs and to monumental plate publications? In the best sense, the art museum should be a supplement to a library as far as the history of art is concerned.

My idea is: Set the pace in your ideal of a library, and then inquire what are the absolutely unavoidable shortcomings in any museum, which only a library can fill. Next, inquire what can be done with casts and photographs to fill in the gaps which, in practice, even the best equipped museum will inevitably show. However far the actual thing may be from the ideal, the best practicable thing can only be reached by having an ideal in view.

What is needed in art museums is the historic point of view for historic objects and the disposition to balance up unavoidable deficiencies by photographs and casts. That balanced and comprehensive selection is more important than massive exhibitions in special fields, is widely admitted for museum exhibits of originals, and the observation of this same rule for photographs and casts will carry us a long way on the road to popular synoptic art museums.

That a good art library bibliography, well classified, should be a valuable assistance to a museum expert, few will deny. We will admit that many good museums cannot possibly own and ought not to own twelve thousand dollars' worth of books. But no one is confined to a single library, and if the bibliography once exists, the knowledge and consultation of books are furthered. The knowledge of their existence and of their correlation ought to be widespread.

A specially close relation between libraries and museums holds for the field of history. The value of art museums as institutions for the suggestion of the broad facts of general history cannot be overestimated.

ART HISTORY AND ART MUSEUMS

Even considered in the narrowest point of view, that of "art for art's sake," the true theory of cultivating the art sense is to place the student in contact with good examples, and with the best. These are, in the majority of cases, historic examples. Even in painting, where some modern artists occasionally, or possibly, rival some of the older ones in individual cases, the historic models offer the best standards. If we desert them we find ourselves disturbed by our own individual tastes, by the contentions of modern critics and by the contemptuous attitude of one modern artist, or of one modern school, toward another, when both may ultimately prove to be meritorious. It is not denying the greatness of modern literature to hold that the historic standard authors offer the best examples for educational training. The same point holds in a much more eminent degree for art.

Thus the problem of the museum of historic art is to select its examples in a properly balanced distribution, whether casts, photographs, or originals, and to arrange them in historic sequence and relation. The problem of the art library is not only a related problem; its solution may even be an assistance to the art museum.

The mission of the museums of the future is not to supplant or to excel, in the matter of original possession, those already formed. Such ambition is, in many directions and in many cases, puerile and unattainable.

What the public needs to know first and foremost is, what the best things are and where they are. It is as much the business of the art museums of the future to assist the public to this knowledge, as it is to collect originals of their own. But also in collecting such originals, the relations of these to other originals must be made known and the unity of these relations should be apparent. Otherwise the focus is lost and the perspective disappears.

DISTINCTION BETWEEN MODERN ART GALLERIES AND HISTORIC ART MUSEUMS

In considering the problems which confront our museums of art in America, our theorists sometimes overlook a very practical consideration. This consideration is mentioned in closing, without special reference to my own paper, unless it should occur to someone that this paper appears to neglect modern art and that it is in so far defective.

There are no important museums of historic art in Europe which include in their exhibits modern contemporary art by living artists. There are no important museums of historic art in the United States which do not include contemporary modern art by living artists. Let us consider, for a moment, the result of this difference. This result is, in my opinion, a confusion of theories and views, caused, in America, by discussing two kinds of museums or galleries which are really quite different, but which in America almost invariably exist together under one roof. There is not the slightest objection to this combination in the United States. It is certainly inevitable and it is very likely desirable. What I do object to, is the confusion of ideas which results in discussing the mission of an art museum and the point of view to be taken about it.

The point of view must be different in the case of a gallery of modern art from the point of view in a museum of historic art. If we combine the two things in one building let us not forget that a different point of view must still be taken for the two different capacities of the same museum. The point of view for the gallery of modern art must be the point of view of the modern artist, and no doubt there may be different points of view and many debatable questions, within the limits of the general point of view of the modern artist. The point of view for the museum of historic art (and this holds, even if it be combined with the modern gallery) must be the point of view of the art historian.

The good art historian is necessarily a good critic, and he must consequently be a good judge of modern things, but his attitude toward historic art must be to consider its environment and to consider its evolution, and first and foremost to consider the work of historic art from the standpoint of the time and race and period which produced it.

Many theories and much debate about historic art will drop out of sight if we ask the simple question, What was the idea of the thing in the mind of the man who made it and what did he make it for? The work of historic art is a document and a record of history. As such it should be considered and as such it should be treated. The greatest modern critics have been developed as students of historic art. Therefore we need not fear that the accent which has been placed in this paper on historic art, as distinct from modern art, may suggest or indicate an indifference to the latter.

Mrs. Cornelius Stevenson, of the Pennsylvania Museum and School of Industrial Art, Philadelphia, then read the following paper:

THE TRAINING OF CURATORS

It may be remembered that last spring, the Pennsylvania Museum and School of Industrial Art, with which I have the honor of being connected, sent out circulars announcing a course for curators. It has occurred to me that, as this was an experiment in our school, and as far as I know, it was the first course offered in the country by any school, you might be interested in discussing its aims and in following its vicissitudes.

The thought that prompted the offering of the course was born of the increasing multiplicity of museums, and our personal difficulty in obtaining satisfactory assistance. Although as yet, no millionaire has offered to do for museums what Mr. Carnegie has done for libraries, it would seem as though the enlargement of existing museums, and the increase in the number of such institutions, must create a demand sufficient to make the training of educated men and women for such work worth while. If the multiplicity of libraries caused the establishment of the new profession of librarians, is it not likely that the care of art and other collections which every year are increasing in money value, and are becoming more and more difficult to obtain, will make it advisable for a number of young men and women to fit themselves for professional work on these lines. One fact at least seemed to point to this conclusion, namely, the establishment of this American Association of Museums, the discussions of which are likely to create definite standards of museum work: standards of building, lighting, heating, installing, equipment; standards also of museum economics and administration. I believe that the time is coming when museum science will have definite standards with regard to the various branches of the work, just as any other branch of learning. In annually directing the attention of the members of this association to museum economics, museum æsthetics, and even to museum ethics, the principles of museum science must in time become more or less fixed, or at least so formulated as to form a firm basis whereon the museum curator may rest his conduct and general standards. Thus a point may be reached where in time the work of training may proceed along definite lines generally recognized and accepted as the best, with the result of minimizing the waste of time and money which now occurs in experiment, each repeating the mistakes of others.

Meantime, a tentative course was opened on October 15, 1908, with 11 registered applicants. The requirements were a high school education, and a $10 fee for outside students. To the students of the School, it was offered as a course of the Art Department. The first lectures of the course, as stated in the syllabus appended to the circular, dealt with the historical aspect of the subject, and therefore were of general interest. They drew an audience, outside of the registered students, to a maximum of thirty. When the more special lectures were reached, however, the registered attendance alone continued. These students showed such earnest interest, that after consultation with the authorities, the course was extended to cover another semester.

The class was now taken to the various museums in the city, and much profitable observing was done under the guidance of the curators in charge, who most kindly explained to the class the special features of their respective institutions. After each of these visits, a critical survey of what seemed excellent was made and balanced against what seemed faulty in the museum. In this manner, it was possible to gauge the degree of understanding reached by each member of the class. Moreover, it was found that this method tended to develop in the students the critical faculty besides keeping their attention 'keyed up' and alert.

In this ambulatory part of the course, the best obtainable results were secured by making appointments with the directors of the respective museums visited, who kindly went with us and placed at our disposal every facility for investigation, explaining administrative methods, reasons for the selection of any special equipment, and who gave us the result of various experiments in installation and in administrative details. I am glad to have this opportunity to thank our colleagues for the inestimable service which they rendered us. From every visit we carried away some important idea. I believe that you visited to-day the Wistar Museum of Anatomy, and, no doubt, you will appreciate what a full explanation of the practical administrative methods arrived at by Dr. Greenman, in the simplification of clerical labor in running his office, for instance, must mean to the student, when engaged in forming unto himself an ideal of what economical administration could be brought down to with proper care and study. While a visit to other museums might suggest to him what such an institution could be made to be, if started, *de novo*, by a student of the science, untrammeled by tradition, by uneducated boards and inexpert committees, or by financial restrictions, and above all by the æsthetic architect, who cheerfully sacrifices to the beauty of the façade the most important availability of the museum building and its assigned purpose.

It is relatively easy with the expenditure of large amounts to produce an effective display that will impress the visitor. But such a display may not always be the most educational nor the most scientific method of exhibiting specimens, and often the result obtained does not warrant the space assigned to it nor the outlay incurred. Outside of New York, Chicago, and possibly Boston, money is usually difficult to raise for museum work, and it is necessary to the progress of museum science that the subject of museum economics shall be brought to bear upon administrative methods.

The idea then, in giving the course, was to endeavor to take from our collective experience to date, the most satisfactory achievement in every branch of the work, and thus to try and get at an ideal museum standard, toward which one may point as the aim of museum effort: the aim being to obtain the highest degree of efficiency at the minimum cost.

In my preliminary effort to gather the material upon which to base the attempt, I made use of the transactions of this association, as well as of the reports from various institutions, and especially of Dr. Meyer's critical survey of the museums of this country. I also entered into correspondence with Dr. Meyer, and am indebted to him for many valuable personal suggestions and much encouragement. To Dr. Rathbun of the Smithsonian Institution, I also owe thanks for his helpful interest, and a personal explanation of his plans for the handsome new building now being completed at Washington. Of course I made good use of the voluminous writings of our Nestor, the late Dr. G. Browne Goode, and of much important information personally collected by me from him and others at the time when I was studying museum buildings in this country and abroad, as well as museum management, with a view to the erection and establishment of the Free Museum of Science and Art in this city, of which I was then Secretary and afterwards President.

After visiting every museum in Philadelphia, and studying what we had learned from each, the class came out to the Pennsylvania Museum at Memorial Hall, and did some practical work, applying some of the knowledge acquired. At this stage of the experiment, the season being well advanced, for one reason or another the class was reduced to six. I have been told, however, that such a result of putting students to practical work is not uncommon, and that the same phenomenon occurs in other classes of the School. As against this, those who remained would have continued as long as permitted. The technical lecture on museum chemistry, to deliver which I was fortunate enough to secure the generous service of Mr. George Brinton Phillips—a chemist who is interested in certain aspects of archæology and who was kind enough to give a demonstration of the action of certain chemicals and of the proper tests for the presence of chlorides and other deleterious substances present in ancient pottery, stone, and metals long buried in the soil—was attended by a number of extra persons. This, by the way, was a most valuable as well as most interesting lecture.

It is my belief that of the 11 students who originally registered, only five had any idea of applying the knowledge they might acquire to actual museum work. The most earnest and promising member of the class hopes to become a teacher of industrial art, and took the course especially with a view to broadening his outlook by going back to original sources in art work.

A second course is planned for next year, which will include the study of ornament with reference to the identification of objects, dealing with what is common to all races, and what is distinctive, bringing out the peculiar characteristics of each locality, the treatment of certain forms by certain ethnic groups, which will enable the student to recognize the original province of an object by its decoration, and dealing with certain periods and their peculiarities.

In conclusion, it seems to me that, just as libraries have a standard and a system of administration which is crystallized in a well-defined plan for the training of assistants, leading to a recognized profession, the time has come when the go-as-you-please method of museum building and museum administration must settle down to something less vague, less whimsical, and more definite. Already, owing to this association, the museum situation is less chaotic than it was, and gradually a tendency to uniformity is observable to old museum workers who know somewhat of the earlier days. The time is not far off when a standard of museum excellence—passed upon after mature discussion by such a body as this, made up of persons of experience—will be attained, and when the great museums of this country, having settled on this standard, will undertake the training of assistants along a recognized line of theoretical and practical efficiency, that will open up hopes of promotion as a reward for efficient service; all of which must tend toward the economic advantage and scientific advancement of the work, and toward the higher dignity and material interest of the profession.

When, this afternoon, it was suggested that certain subjects be selected for "round table" discussions at the next meeting of this association, it occurred to me that the subject most in need of discussion just now, is the possibility of arriving at a standard of museum administration, a definite system of museum economics and standards for each branch of museum equipment and installation; and that I should propose to you this evening the systematic discussion of the subject in its various branches and aspects, with the object in view of establishing a basis for the training of curators and of opening a career to men and women of liberal education.

At the conclusion of Mrs. Stevenson's paper it was voted upon motion by Dr. W. P. Wilson that a round table discussion on the "Training of Museum Curators" be arranged for the next meeting of the Association.

The remainder of the session was devoted to the demonstration of lantern slides prepared by Dr. Carlos E. Cummings, of the Buffalo Society of Natural Sciences, for use in educational work with the public schools.

The meeting then adjourned.

SESSION OF THURSDAY, MAY 13

Morning

The Association met at the Academy of Natural Sciences, President Holland presiding. In the absence of the president of the Academy, Dr. Arthur Erwin Brown welcomed the Association and briefly compared the work of the Academy with that of other museums. The following paper was then read by Prof. William C. Mills, of the Ohio State Archæological and Historical Society, Columbus, Ohio:

THE ARCHÆOLOGICAL ATLAS OF OHIO

I take pleasure in reporting upon the progress of the Archæological Atlas of the State of Ohio, which has been under headway for about six months. At the present time we feel encouraged in the preliminary work and hope to have the Atlas completed in the time specified, namely, three years.

However, many difficulties have arisen, such as the size of the county map. Many counties contain numerous remains while others only a few and the maps had, therefore, to be adjusted so as to contain all of the remains such as mounds, earthworks, and village sites. To secure the proper data concerning the mounds and to properly place the same upon the field map constituted another problem. The Society has selected the maps of the topographical survey of the state and, in many instances, portions of the county only have been finished, and this is a great hindrance.

The size of the Atlas will be 14 x 17 inches. It will contain eighty-eight maps representing the eighty-eight counties in the state. As an introduction, two maps of the entire state will be given, one showing the location of Indian tribes and villages before Ohio became a state and the other showing the Indian trails, old forts, and battle grounds.

A concise archæological history of the county, together with a summary of its prehistoric remains and the explorations therein, will constitute the introduction for each county map.

The curator has been directed to visit each county in the state for the purpose of securing the necessary data and at the same time to place upon the field map the location of mounds, earthworks, village sites, work shops, ancient quarries, rock shelters, gravel burials, etc., that may be found in the county. The map for the Atlas will be made from the completed field map on a scale of one-half inch to the mile.

President Holland.—"Have you any idea that the location of this prehistoric semi-civilization was co-incident with the ice age or antedated it? Is it a fact that the glacial area seems to be completely free from these remains?"

Professor Mills.—"We find paleolithic remains in a number of places in the state as you know, but we find also that the prehistoric remains come after the glacial period, occupying the territory deposited by the glacier and utilizing it for their agricultural purposes. I do find these two—and only these two—great cultures extending over the state. There may be a third. The two great cultures are quite separate and distinct. We find they all smoked pipes and the very moment you see one of those pipes you can tell whether it belongs to the Hopewell or Fort Ancient. Take the needle made from the metatarsus of the wild turkey; in the Hopewell culture they made two needles out of it, in the Fort Ancient culture one needle. The pottery is the same way."

Dr. Oliver C. Farrington (Field Museum of Natural History, Chicago, Ill.).—"I would ask Professor Mills if the connection of the culture with the terminal moraine does not argue the existence of man subsequent to the ice age. The connection of man with the terminal moraine arose from the large quantity of physical materials for his cultures that he could find in the drift brought by the ice. These would be available only after the retreat of the glacier."

Professor Mills.—"There is no question that in the gravels near the terminal moraine we find the remains of both these cultures coming in evidently after it. There is no doubt that this glaciated region furnished both the territory and the material for agricultural work."

Mr. Frank C. Baker (Chicago Academy of Sciences).—"Has there been any attempt to find whether the aborigines followed closely the retreat of the ice? I find that many mammals and molluscs followed the retreating ice very closely, not only during the last glacial period, but also during the others. Are there any records as to whether the aborigines also did this?"

Professor Mills.—"I have not found any."

President Holland.—"The next paper will be presented by our friend Mr. Witmer Stone, curator in the Academy of Natural Sciences, Philadelphia, and one of our hosts of the forenoon."

PROBLEMS OF MODERNIZING AN OLD MUSEUM

The few remarks that I have to make this morning do not perhaps accord very well with the title as originally handed to our secretary and must be taken rather as an historical contribution than as outlining a policy for others to follow.

Few persons entering upon museum work to-day, in a comparatively modern or a new institution, can form any idea of the problems that confront one in caring for collections that have nearly or quite a hundred years of history back of them; especially when, in that time, they have grown to be among the largest collections of their kind in America, while their arrangement follows the ideas of the early days of their history.

This institution was founded in 1812 when Peale's Museum was at the height of its fame, and when a public museum consisted entirely of show cases. On such lines the Academy Museum was established and on similar lines its development took place.

Taking the collection of birds as an example of its growth, we find that, largely through the munificence of Dr. Thomas B. Wilson, a former president of the Academy, it had grown from a very modest beginning to be, in 1858, in the opinion of no less an authority than Philip Luther Sclater, the finest collection of birds in the world.

When I became acquainted with the collection in 1888, it had had no attention from an ornithologist since the death of John Cassin twenty years before and was practically in the condition in which he left it.

There were 25,000 specimens, all mounted, for, according to the ideas of the middle of the 19th century, every specimen was supposed to be on exhibition. The ornithologist, who to-day can sit comfortably at his desk with thousands of bird skins in cabinet drawers within arm's reach, can realize the difficulties that attended John Cassin's researches when tray after tray of mounted specimens had to be carried from the museum to the library and there stood upon tables gathering dust until their investigation was completed. Our librarian, Dr. Nolan, tells me of a large metal oven in the basement in which infected specimens were placed in the old days and baked until the insect pests and their eggs—and occasionally the specimens themselves—were destroyed. Data were written on the bottom of the stands, occasionally with the addition of personal or historical comment. One stand, for instance, bore the inscription, "Labelled by John Cassin this 29th of Nov. 1848, ¼ before 8 o'clock in the evening—Wednesday;" another, "Just heard of the downfall of the French Empire, Vive la Republique." I found also the handwriting of

Townsend, Audubon, Baird, and Peale—names that cannot but recall the early history of ornithology in America. Exhibition labels were borne by many specimens, some of those prepared about 1850 having colored borders representing the continent from which the specimen came and conforming so far as possible to the color of the natives. North American specimens had red-bordered labels, African, black, and Asiatic, yellow. Here, however, this resemblance ceased, as the Australian specimens bore green-bordered labels.

The amount of crowding that was necessary to get the 25,000 specimens into the exhibition cases can readily be imagined and I need not tell you that not half of the specimens could be seen. There were no less than 1500 hawks and eagles, for instance, among which were 30 specimens of the sparrow hawk, 38 duck hawks, and 18 golden eagles. The visitor wandered aimlessly about in this maze of birds and the ornithologist had difficulty in examining such specimens as he wished to study, yet this was the prevalent idea of a museum exhibit fifty years ago. The late Dr. Joseph Leidy used frequently to refer to the bird collection as a sort of white elephant and doubted if the Academy would ever have the space to properly exhibit it. At the present time this collection has been cared for in rather less exhibition space than it formerly occupied, but two-thirds of it has been unmounted and placed in moth proof cases, where it is easily accessible to specialists. With the elimination of duplicates and other specimens unnecessary for display, the visitor views the collection with far more intelligence and profit than was possible before.

The prospect of reducing that collection of 25,000 specimens to the proper size and of transforming the majority of specimens into study skins, not to speak of the task of procuring tight cases for their accommodation, and the cataloguing and labelling incident to the work—all at a time when funds for the purpose were not available—was, to say the least, appalling, and was not accomplished in a single year. Furthermore, every specimen had to be cared for, no matter how damaged or unsightly it might appear. The entire history of the collection had to be worked up and all possible types or historical specimens hunted out, for in the old days authors did not clearly mark their type specimens, and not until this had been done was it possible to discard any apparently useless duplicates. Finally, the data on the wooden stands had to be carefully transcribed to the labels and the catalogue pages and, in the case of types, the bases of the stands themselves were preserved and numbered. As a result of this work over 600 bird types have been identified and properly cared for in special metal cases, while the study collection, starting with about 15,000 unmounted specimens has grown, with additions of modern material, to a collection of some 45,000 specimens. The handling of these additional 30,000 modern specimens, with modern cases available for their reception, was but an incident compared with the renovation of the original mounted collection.

Up to about 1890, our Academy museum like most other old institutions, contained only exhibition collections and every specimen obtained was exhibited. I have mentioned the ornithological collection simply as an example and one with which I was especially familiar. There were only two exceptions, namely, the departments of Entomology and Botany, in one of which exposure of specimens to light had long been admitted to be fatal and consequently exhibition was out of the question, while in the other, exhibition had never been feasible. No quarters for study collections were provided, therefore, in the plans for the present Academy building which were drawn in 1876. In fact there was no thought of the possibility of such quarters being needed. Furthermore, with all the specimens installed under glass there was need for but one curator, who could do such labelling as was necessary and keep an eye upon the perishable specimens. The idea of a salaried staff doing original work was as remote as the idea of study collections upon which their work must be based. Such work was done in those days by the amateur or by volunteer members of the Academy and the curator's office was, so to speak simply to open the cases for them.

Our work of modernizing such conditions has included, among other departments, the collection of mollusks which, were the cases and glass covered drawers on public exhibition to be placed side by side, would have covered over 5000 square feet of space. A conchologist identifying specimens could easily have traveled a mile in the course of a morning and visitors tired of the display before examining a dozen cases. This collection has been largely condensed by the use of storage cases, though fortunately no radical alteration in the condition of the specimens themselves was here necessary.

In the department of mammals, the original collection has been almost entirely reduced to study specimens or discarded, as the 'stuffed' mammal of fifty years ago proved simply impossible when compared with the 'mounts' of today.

The jars of reptiles and fishes formerly arrayed in row upon row of wall cases, the alcohol usually so discolored that no idea of the specimen could be obtained, have been entirely withdrawn from exhibition and are soon to be installed in a fireproof alcoholic room where they will be of easy access to the specialist. Plaster casts take their place in the public museum. Here, as in the case of the birds, an enormous amount of labelling was required and, in addition, 18,000 reptiles and amphibians have been tagged with pure tin tags stamped with the catalogue number to avoid any possible mixing when specimens from different jars are compared.

And now a word as to the cases used for study collections. Our Academy was not in a position to ignore the question of expense when installing cases, as some more fortunate institutions are apparently able to do. We had to use the cheapest cases that would answer the purpose, and, in all departments where perishable specimens were concerned, the Cambridge cans have been found most satisfactory. Modifications have been made, especially in those designed by Dr. Henry Skinner for the storage of insects. Cast iron rims have been substituted for the original hollow tin rims. These make the doors absolutely rigid and do away with the necessity of clamps on the top and bottom. These insect cases are fitted with wooden racks upon which the Schmitt insect boxes slide. Similar cases are being installed in the herbarium. The great advantage of these comparatively small unit cases is that an additional unit can be interpolated at any point where the collection is congested without the shifting of all the drawers and boxes. Tight modern cases with grooved panel doors and ice-chest clamps have proved very satisfactory even for the storage of large bird and mammal skins. These can be covered with metal if desired.

A new alcoholic room is now being fitted up, which is absolutely fire proof in itself and is shut off from all other departments. Metal covered cases with panel doors are being erected here and are fitted with sliding trays measuring 18 × 12 inches, with sides high enough to prevent the jars from toppling over. Each tray will carry generic or specific labels on the front and can easily be lifted out to a convenient table. When arranged on shelves, jars have to be placed in a single row or there will be constant breakage in reaching for jars in back rows and the single row involves great waste of space. The tray plan obviates this disadvantage while the tight cases protect the specimens from light and prevent the jars from gathering dust, which proves so much of a nuisance in the handling of alcoholic specimens.

In comparing the old Academy with that of to-day one is struck with the significance of certain other changes that have gradually taken place I can remember the care with which a prospective herbarium specimen was compared with those already mounted for fear of installing a duplicate. Nowadays duplicates are not only admitted but series of specimens are a desideratum, for as time has passed the species is no longer a cast iron unit but a 'morph' or a 'mutant' or other indefinite concept that changes its limitations with every author and cannot possibly be adequately represented by a single specimen. So, also, in entomological collections we formerly found on the pin below the insect only a minute locality label, while now we find several labels setting forth the exact locality, date, and collector, as well as the altitude and character of the country or vegetation where the specimen was taken. All this information is required by modern investigations along geographical or ecological lines which to-day have become of equal importance with the mere naming of the specimen.

The contrasts that I have drawn between the old and new museum are presented simply to emphasize the importance and the extent of the work that has had to be done in the older museums of the country, before much attention could be given to modern exhibits for popular instruction. This work in spite of its importance cannot be noticed nor appreciated by the general public.

There is little that is new in the plans that I have described, but I have attempted to emphasize: (1)the enormous burden imposed by vast historic collections upon an institution with a moderate income; (2) the responsibility to science that rests upon such an institution, until these collections are safeguarded and arranged in accordance with modern ideas; (3) the impossibility of such institutions competing with new museums in educational displays until this work has been accomplished. We have so many new, well-endowed museums springing up which are able to formulate their plans in advance and guide their development in accordance with them, that we are sometimes inclined to look upon the older institutions, which have made possible America's scientific development, as slow or behind the times, and fail to realize the work that they have to accomplish before they are in a position to start on an equality with newer institutions.

So, too, we are inclined to overlook the historic evolution of the modernized museum, and the societies that in most instances gave them birth. Yet it is interesting to picture the little club of scientific men—like that which founded this Academy—meeting for informal discussion one evening of each week, and contributing to the nucleus of a collection which they could all handle and study. Next came the erection of a special building for the meeting and for the housing of the collections, and then a larger one; one member perhaps being appointed as curator. The privilege of members to make use of the collections as they wished, and also the club feature was retained in the informal gatherings and smokers after the regular meetings. Finally came the gradual development of the great public museum with salaried specialists in charge of the various departments, and the differentiation of material and specimens into public educational exhibits and study collections for special research work.

The changes have been truly remarkable and one cannot but wonder what the next fifty or one hundred years will bring forth. The preservation of material for study is a policy that can hardly change, but the future of our exhibition collections and the evolution of our present methods and ideas as to installation, cases, labels, etc., can scarcely be foretold.

President Holland.—"The paper is before you for discussion and comment."

Dr. Henry Skinner (*Academy of Natural Sciences, Phila.*).—"I think this case is probably the best that has ever been devised, considering its cost. I have discarded the wooden case. I think the wooden case is unsatisfactory from almost every standpoint. Wood will warp, attract dust and sometimes moisture. The advantage of this case is that it is absolutely pest-proof. If, through carelessness, a case like this should become infested, it is an easy matter to introduce volatile poisons. Moreover, it constitutes practically a card catalogue system. It is a simple matter to introduce an additional box. I think at the present time we are in a position to preserve insects indefinitely, for museum display or for study purposes, almost as easily as we do minerals. The case costs, without the boxes, approximately $11."

President Holland.—"The Chair will take the liberty of saying that this case is evidently an adaptation for entomological purposes of cases which are and have been for a number of years in use in Washington and other museums for the storage of birds. They have an arrangement by which the front door can be closed tightly. We have a series of cases larger than these, with drawers for storage of birds, some of the drawers being six feet long and three or four feet deep. We find it a most excellent system for, by putting on the door and clamping it, you hermetically seal the contents. Then too, I believe the method is highly practical. We have been much interested in these remarks of Mr. Stone."

Dr. Skinner.—"I might mention that the Academy has in use 250 cases such as the one described for the birds and insects."

Mr. Frank C. Baker (*Chicago Academy of Sciences*).—"It is pertinent for me to say one or two words, for, of the visitors present, it is possible I appreciate what Mr. Stone has said more than any one else. Some twenty years ago it was my privilege to be a Jessup student in this institution, and I remember particularly the 25,000 or more bird skins that Mr. Stone spoke of, and of wandering in the gallery above us. I would like at this time also to acknowledge my indebtedness to this institution for I realize that some of the training I received here has made my present position possible. I hope there will be a reunion of the Jessup students. I think the hundredth anniversary would be a proper time, and I would suggest to Dr. Nolan that he send a notice to all Jessup students, whose address is known, and invite them to meet at that time for a reunion. There are quite a number living and it would be a pleasant thing for us to form here a Jessup student society."

President Holland.—"We will proceed to the next paper, which is by Mr. Frank Collins Baker, curator of the Chicago Academy of Sciences."

EXHIBITION CASES WITHOUT SHELVES

It has been the ambition and earnest desire of nearly all museum men that a practical system might be devised, by which certain exhibits, such as birds, fishes, and other vertebrates, might be prepared without the use of shelving, which invariably detracts from the appearance of the object exhibited. A number of schemes have been formulated and put into practice, with greater or less success. The difficulty with the majority of these schemes is, that the objects thus exhibited are fixed and can not be moved to another part of the case or interchanged in any way.

About three years ago, the writer began experimenting on the local bird collection in the Chicago Academy of Sciences and, in conjunction with Mr. F. M. Woodruff, installed one case without using shelving of any kind. The birds were mounted on natural branches which were fastened directly to the case by means of sharpened steel pins fastened in the end of the branch and forced into the back of the case. This method has proven quite satisfactory and presents a pleasing appearance.

The installation of this case was comparatively easy, owing to the fact that it contained a local collection, the limits of which could be very

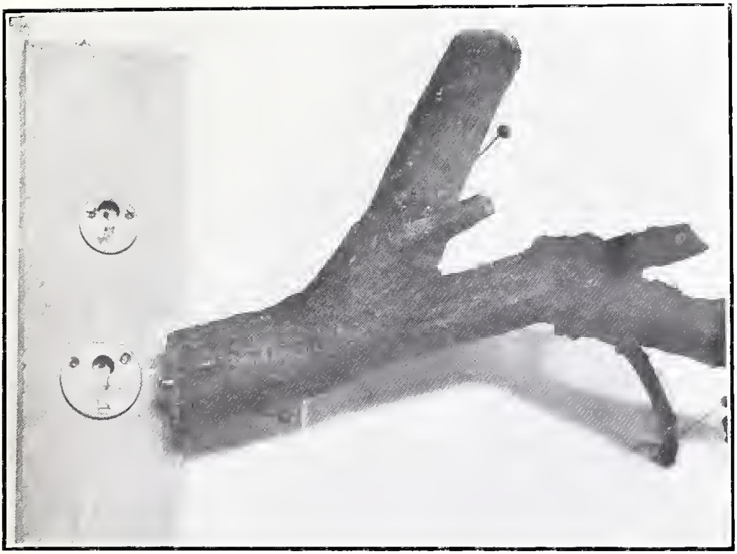

FIGURE 1 BRACKET DESCRIBED IN MR. BAKER'S PAPER

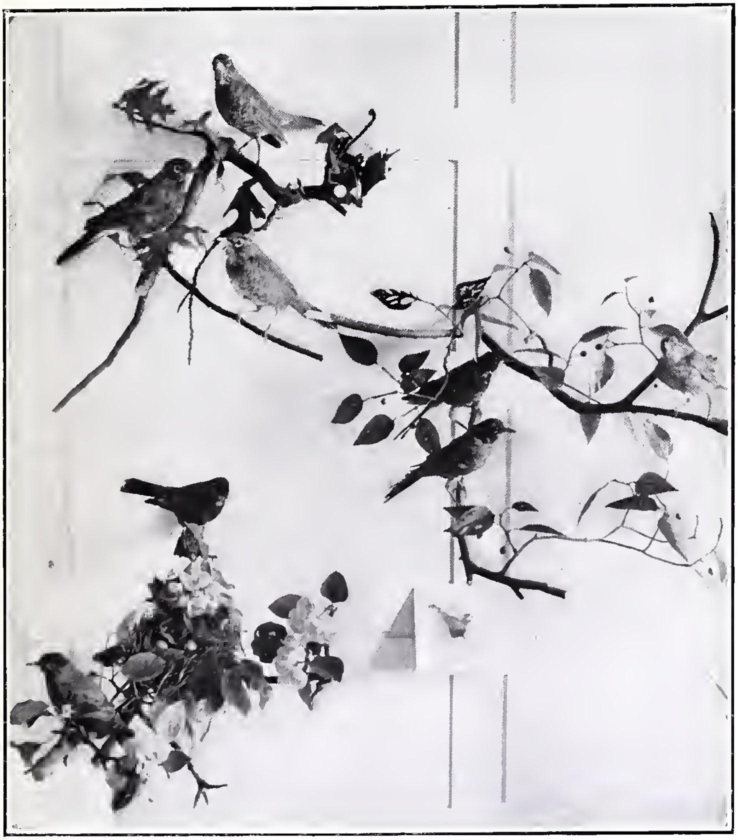

FIGURE 2 THREE GROUPS MOUNTED WITH BRACKETS LIKE THAT IN FIGURE 1

accurately determined. With a general collection, however, the case is quite different, it being well nigh impossible to predict what the limit will be, and for such a collection the system must be flexible enough to admit of changing and rearranging the specimens as may be desired.

After considerable experimentation, a method has been devised which seems to answer all the requirements, at least, for the exhibition of birds. This method may be thus described:

A brass plate with a key-hole-like perforation is fastened to the back of the case. The perforation is made large enough at the upper part to admit of the passage of the head of a screw, the neck of which drops into the narrow part of the perforation. A hole one-fourth of an inch in depth and of the diameter of the perforation is bored in the back of the case behind the perforation. A screw with a rounded head just small enough to pass through the large part of the perforation is securely fastened to the butt end of the branch upon which the birds are mounted. This screw is inserted in the branch just far enough to allow the butt end of the branch to fit snugly against the plate when forced into the narrow part of the perforation. When the branch is in place the plate is entirely hidden and the branch appears to proceed directly from the back of the case. As the interior of the case is painted a uniform blue-gray color, the plate is inconspicuous even when not covered by a specimen. By this method, the back of the case may have a number of unused plates in position which will scarcely be noticed, and which will be in readiness for additional specimens or for any rearrangement which may be made.

So successful have been the experiments with this system, that plans are now made for installing four double cases of birds in the manner indicated above. These cases are to contain only the birds of northeastern Illinois, and will be divided into two series. The first series will be taxonomic, with family, species, and food labels; the second series will be ecological and will illustrate the nesting habits of local birds. The arrangement of this collection will be by the nesting habitat; as birds that build on the ground, in holes in trees, in low bushes, etc. It is believed that the greatest teaching value may be obtained from a collection arranged in this manner.

It was thought at first that the round screw in the branch would be liable to turn in the socket and tip the exhibit sideways, but such has not been the case in practice, the branch binding enough to secure a firm fastening.

The figures illustrate this method of installation: Figure 1, two plates fastened to back of case; branch with screw (s) in butt, ready to be placed in position; figure 2, case installed by the new method, showing branch-nesting bird exhibit attached to back of case.

NOTE—After using this method of installation for six months it has been found that better results are produced by reversing the method, *i. e.*, attaching the brass plate to the butt end of the branch and fastening the screw to the back of the case. In heavy groups which are somewhat top-heavy, it has been found necessary to use a screw with a flat shank, to prevent turning when in position. With these changes, this method of installation has proved eminently successful, not only for groups, but for panels containing heads, feet, etc., which may be suspended directly from the back of the case.

President Holland.—"Are there any remarks upon the paper? There is an opportunity for questions or discussion."

Prof. E. S. Morse (*Peabody Museum, Salem, Mass.*).—"I use a similar case. We have in our museum at Salem a tablet that can stand vertically or inclined and I adjust a little shelf with these same catches. We display everything now on a square tablet and the pane of glass corresponds with the size of the tablet. One can take it out to study it or compare it with others."

President Holland.—"We will pass to the next paper, which is offered by Dr. Oliver C. Farrington, curator of geology in the Field Museum of Natural History, Chicago."

A DEVICE FOR EXHIBITING FADABLE MINERALS

It is well known that many minerals fade or change color on exposure to light to such an extent as to prevent their exhibition for any long period in public museums. Such minerals may be termed fadable minerals. Wine-colored topazes which lose their color completely, delicately shaded fluorite which becomes dull and lustreless, brilliant red crocoite which changes to a dull brick-red, transparent ruby-colored crystals of proustite and pyragyrite which turn black and opaque, and realgar which actually changes in composition and crumbles to a dull powder, may be mentioned as illustrations. Even some of the metallic minerals, such as pyrite, lose their brilliant lustre when exposed too harshly to light. These are but examples of the changes which long exposure to light may produce in minerals and forbid their exhibition in museums in the ordinary way.

If the usual practice is followed of omitting such minerals from the exhibition series, many very attractive and showy specimens will be lost to view, and the visitor can get but an incomplete knowledge of the mineral kingdom from examining such a collection. To obviate this to some extent such minerals are, in the British Museum of Natural History, placed in their proper order in the exhibition series, but covered with wooden boxes. The boxes suggest the presence of additional specimens, but view of them can only be obtained by securing the attendance of the curator in person to open the case and lift the box. In the Paris Museum of Natural History, the fadable minerals are placed in their proper order in the collection, and panes of yellow glass are inserted over that portion of the case. This glass, by cutting off the actinic rays of light, largely prevents any fading of the mineral, but the appearance of the mineral is rendered quite unnatural. Aside from these two practices the writer has never seen any method adopted which would permit examination of fadable minerals by the visitor and at the same time protect them from light.

In the endeavor to accomplish these ends the device shown in the accompanying model has been prepared by the writer and is employed in the Field Museum of Natural History. The device consists of a mechanism which allows the visitor from without the case to raise boxes covering the fadable specimens but ensures automatic return of the boxes to place when the examination has been finished. This is accomplished in the following way: A button placed on the outside of the case connects with a concealed series of levers reaching to the covering box or boxes. On pressing the button the covering box is raised, and on removal of the pressure the box returns to place by its own weight. The specimens are thus protected from light except for the moment when it is desired to examine them. When several specimens which it is desired to protect occur in one case, the levers of the different boxes are connected by a single transverse rod which is controlled by a single button. In such cases it is usually necessary to weight the rod forward in order to insure return of the boxes to place. This is, however, easily accomplished. While the movements of the boxes might obviously be accomplished by means of electrical connections instead of the mechanical ones here employed, the mechanical method seems preferable since it avoids the necessity of wiring the case and of refilling batteries at frequent intervals. For the very ingenious joining of the levers to accomplish the control of the boxes, the Museum is indebted to one of its carpenters, Mr. Valerie Legault. The device at present employed is applied to cases in the Museum which have sloping sides, but it can obviously be equally well applied to upright or even flat cases. While it has been devised only for the protection of minerals which are fadable, it will be evident that other objects requiring protection from light, such as insects, shells, and textiles, can be treated in a similar way.

President Holland.—"The paper is before you for discussion."

Mr. Frederick A. Lucas (Brooklyn Institute Museums).—"I was wondering whether it would not be well for the Association to patent this device so as to be able to use it."

Dr. Farrington.—"I shall be glad to hear the opinion of the Association on this point."

President Holland.—"This is a matter of practical importance. I think it is a very regrettable thing that a body of scientific men, working for one common end, should be exposed, through the cupidity of others who have not the general welfare at heart, to the risk of having an invention seized and patented by some one, who is not impelled by the same love for the general cause as the inventor is. I know of a number of museum inventions that have been patented by concerns and corporations. This Society cannot patent and take out patents. It is absolutely impossible. We have no corporate existence and until we do become a body corporate, and have rights of that sort, it would be impossible for us to take this step."

Treasurer Wilson.—"It would be possible to accomplish the same end by asking any individual to patent this for the benefit of the Society."

Mr. Frank C. Baker (Chicago Academy of Sciences).—"May I not suggest that the institution with which the inventor might be connected could patent it?"

President Holland.—"The Field Museum is a body corporate. Patents are not expensive."

Secretary Rea.—"Is it illegal to make a patentable article for your own use, if you do not sell it?"

President Holland.—"The Library Bureau has a patent upon a perforated card that is strung on a cord. There was a case not long ago in which they took steps to indict and prosecute a firm which was punching holes in cards and stringing them on cords. They obtained a judgment in their favor."

Dr. A. R. Crook (Illinois State Museum of Natural History, Springfield, Ill.).—"Would the method of using a transparent lacquer employed by silversmiths, protect the minerals in any way?"

Dr. Farrington.—"I do not know how far it has been tried. It might be good in some cases. For many delicate or fragile minerals, the lacquer would be somewhat injurious."

Dr. Crook.—"I would ask whether it might not be wise for us to incorporate."

President Holland.—"It seems to me this matter is one that might be submitted to the Council for consideration as to its propriety. To get a national charter is a difficult thing and, I think, involves considerable red tape."

Dr. Crook.—"I would like to move that the Council take this matter under consideration."

The motion was duly seconded and carried.

Mr. Baker.—"What is the relation of the public to this device? Would a playful boy, for example, or a person on mischief bent, be able to damage it? How does the public know there is a button to press?"

Dr. Farrington.—"We have had this device installed for only a short time, and we thought best not to indicate specially that the button was there. It turned out, however, that the public school children soon found it out and the word went round Chicago. They now take particular delight in pushing that button. We have not seen any damage resulting from it. I suppose, theoretically, there should be a label on the case stating what pressing the button will do."

Dr. James E. Talmage (Deseret Museum, Salt Lake City, Utah.).—"Touching the matter of legality or illegality of an individual copying a device for his own use, I have a pefect right to copy for my own individual use, but if I do it for an institution it is not for my own use. I am manufacturing that article for an institution, and that is certainly illegal. If I wish to do it for myself and myself only, I have a perfect right to make an imitation. I can do anything I like for myself.

"Touching the patentability of this device, I venture to suggest that it is not patentable. There are numerous devices by which we push buttons and pull knobs, and I feel certain we would have difficulty in patenting this one. The principle is not new; the application is. It is too good to be patented."

The following paper by Mr. Elmer E. Blackman, of the Nebraska State Historical Society, was then read by title.

SOME NEW POINTS IN COIN CASE CONSTRUCTION

Owing to my inability to be present, on account of conditions which arose at the last moment, I am sending my paper to be read, if you so desire. I had intended to be there with the case itself in perfect working order, so that a detailed description of the case would not be necessary, but since this is not possible a word picture is necessary.

The case which I expected to show is 27 inches long by 15 inches wide by 4 inches deep, inside measurement. The front is of glass the full size of the box and the back and sides are of wood. One-half of this box is door and one-half is case. The case is 2 inches deep, having a board back, and the door is 2 inches deep, having a glass front. It is hinged and locked together.

The slides or frames which hold the coins or other specimens rest on their axles in grooves made for them in the sides of the case and when the door is closed, these slides or frames are held firmly in position, so they may be turned on the axles by means of a handle extending to the outside of the case. There are eight of these frames in a case and four cases are intended to be placed, two and two, back to back, on a pedestal which will revolve, thereby allowing a good light to be reflected on each specimen even if the room be lighted from one direction only.

The specimens are held between the parallel bars of the slide or frame by means of adjustable springs so that, when the frame is turned, every side and edge of the specimen can be seen in the best possible light and can be brought within three inches of the eye if desired.

Coins require more floor space than any other class of relics, if shown in horizontal cases, and consequently the coin exhibit of many small museums is limited to give room for other exhibits.

If coins are handled at all they soon tarnish and if they are not handled it is very difficult for a student to examine them critically. I have certainly found it necessary to study the problem of mounting my coins in some more satisfactory way than I have ever observed in any museum. How well I have succeeded, you can judge better by a study of my case at close range.

However, I wish to say that coins are not the only specimens which may be mounted in these cases with profit. In the archæological department, Stone Age implements are shown to splendid advantage; an arrow head takes on a new interest when it can be viewed successively from every angle in the best possible light. Fossils of certain kinds are doubled in value for study when mounted so that a class may see them from every view point. Very rare or curious shells can be shown in all their beauty when turned so that varying rays of light will pass through the delicately tinted curves. Bugs, butterflies, and like specimens may be mounted on pins through bits of cork and turned to get the best light and reflection. Thus exhibited, they will make one of the most popular and instructive features of a scientific museum, and yet be perfectly safe from destruction. Ores, agates, crystals, etc., if small, may be profitably mounted in cases like this.

These cases are intended for small specimens, as large specimens which may be viewed from a distance never give the curator a single moment of uneasiness. They cannot be carried off even if they are not locked up. They are so large any one can see them and the label may be made so large that he who runs may read, and it will not hide the specimen. Large specimens take care of themselves, but every museum man knows that the smaller the specimen, the more time and care it takes to mount it, label it, and select its position in the museum, so it may be seen, be safe, and be satisfactory.

When the countless thousands of small specimens are placed loosely on shelves with the label near, we all know the infinite amount of labor necessary to keep the exhibits presentable. With this case one specimen is as good as a hundred, and one mounting or label is good for ten years. The specimen is away from dust, safe under lock, and satisfactory in almost any light, as it may be turned to any angle. It requires no attention from the curator until he wishes to make a new grouping, or gets a better specimen.

In the matter of coins, the specimens may be polished as bright as possible, handled with a pair of chamois gloves and mounted rapidly. When the label is attached and the case closed, the coins will not oxidize as the case is nearly air tight. There is no occasion for opening the case, except once a year, or once in five years, to remove the dust which may get in or which evolves within the case.

Four of these cases should be mounted on a pedestal which will revolve. You can place the pedestal in any quarter of the room and turn each case to the best light for careful study. So mounted, coins will take less than one-hundredth the floor space they occupy now.

We must follow the lead of every avenue of activity and intensify the museum if we are to continue in our usefulness. We must have fewer duplicate specimens, fewer poor specimens, and so arrange our exhibit that our visitors are forced to see, study, and appreciate every specimen in our museum. The world has no time for poor specimens, even poor specimens of humanity are brushed ruthlessly aside in our eagerness to pay homage to those who are really worthy of our attention.

Half the museums are so stored with duplicate material and are so indistinct that the masses absorb but little at a single visit. The cause of this is threefold:

First, the label lacks in force; one is not sure which of the various small specimens it indicates, and the label is not impressed on the mind in close and direct connection with the specimen. This criticism applies to the smaller museums which lack care, and to the minor specimens in larger museums.

Second, the light is inadequate. This is true in every museum for at least a part of the people all the time and all the people a part of the time. The specimen may be removed farther from the eye as the size increases. Dr. Oliver C. Farrington, of the Field Museum, Chicago, stated last year before this body that 36 inches is the extreme distance which objects in a case should be removed from the eye, and I believe the distance is well stated for the extreme, but I notice that we all bring the printed page or the object which we wish to inspect closely, from 8 to 16 inches before the eye. This certainly proves that we get more satisfaction from inspecting an article 12 inches distant than 36 inches distant. I will grant that much of this condition is due to habit and that many of us can see as well if the object is farther away, but we do not think so and so we think we enjoy the shorter range better. The museum is not a reformatory and we must meet conditions as we find them.

The third reason why the average museum is not distinctive, is of more importance and is the line along which reform must be inaugurated if we attain to the greatest usefulness. It is psychological in its nature and as we advance in mental growth, the need for the reform becomes less.

When my little boy goes down town with me his mother asks him, on his return, what he saw—"Oh, just horses, and people, and things." "What did you see in the windows?" "Oh, just things." Nothing distinctive. But when the kindergarten teacher has furnished a lesson on *one* object—say a bird—the boy comes home to tell more than I ever knew about that bird, and he inspires new interest in the specimen studied. "Men are only boys grown tall, hearts don't change much after all."

Our merchants know what I mean by this third lack of distinctive condition in a museum exhibit. They trim their show windows with a single costume on a perfect model and throw on it all the light possible. The old way was to place one mass touching another, one costume resting against another, until every corner of the show window was filled and the masses of people saw "things"—nothing. Mass a quantity of material into an ordinary show case and the effect is the same. The eye takes in surrounding material until the mind cannot fasten on the object exhibited. Shut off other objects and to a certain extent isolate the specimen to be studied, as we do in this show case, and this defect is overcome to a great extent, as each specimen becomes a distinct exhibit and the mind fastens upon it in all its details as the student turns it into favorable light. The threefold difficulty in organizing a distinctive display is certainly overcome by the use of these cases.

The matter of time is a great factor in any museum, large or small. Specimens are mounted and exhibits are arranged and grouped in accordance with the time available for doing the work. At the best, it takes time to place a collection on exhibition and to label it properly. After a specimen is cleaned and prepared for mounting it can be placed in this case as quickly as it can be arranged in a flat show case, and when it is so placed it is off your hands for ten years. When the case is set in its place no one but the janitor need touch it for ten years and it always looks clean and fresh. It will take but two weeks or a month, on the other hand, to destroy the freshness of the exhibit in a large flat case where specimens are loose with labels near. Janitors cannot arrange and clean the exhibits. It keeps the curator and his assistants constantly busy, therefore, to maintain the museum in an orderly manner. When these cases are used, labor of this kind can be devoted to preparing and securing new material instead of constantly working over the old material. Any museum grows according to the ability of its staff to prepare and place material. Every museum has plenty of specimens which could be added if they but had the time to prepare them and the space to show them properly. I refer to historical museums more particularly, but it applies also to art museums, and to scientific museums to some extent.

Another feature of this case must not be overlooked. Someone has defined a museum as "a well assorted collection of labels, illustrated by a few well chosen specimens." If the exhibit must be farther than 36 inches from the eye, the label must be printed in 12 point type at least, and the size of the label completely obscures the specimen if that specimen is small. At 8 inches from the eye, 6 point type unleaded may be used to better advantage, and the size of the label will not detract from the specimen, nor need the label be so large as to cover the specimen. When one looks at this case, where every specimen has its label, the specimens have room to show themselves, and the label does not seem so conspicuous as to give one the idea that there is nothing but labels in the case.

These cases, mounted on a pedestal of four, or in any other way, will allow you to bring every specimen and every label within 8 inches of the eye if you are near sighted. There is no denying the fact that the few cases of this kind in my museum are studied more than any other part of the collection; somehow people like to turn the slides and thus keep the hands busy as they study. A psychologist may be able to explain this.

The cost of installing these cases will be about half the cost of equipping the museum in any other style case. In the first place the sides and back, as well as the frames within, may be made of pressed steel, which is very cheap. When the dies and formers are once installed in some central factory, the cost of turning out these cases in uniform size will be very small. The glass is small in size which makes the cost but little. Every detail of construction can be accomplished by machines, and the material is very cheap. No arrangements have yet been made for making these cases in commercial quantities, but you may rest assured that it will be done if the case is worthy. The pedestal of four cases should have the lower end about 40 inches from the floor and if the ordinary all-glass case is constructed 40 inches high and these pedestals arranged with the supports extending to the floor inside the case, all large specimens may be shown in these all-glass cases, which will certainly double the capacity of the room for museum purposes.

I suggest this as one way in which these cases may be used to advantage. They will also be found very useful in a room where posts or supporting pillars are necessary. Each post may be fitted with a revolving pedestal which will use the post as a support. There are many corners in every museum where these cases will be very advantageous. If I have given you some hint by which the efficiency of your museum may be improved, this paper has not been in vain.

Dr. T. Louis Comparette, of the United States Mint, Philadelphia, then presented a paper entitled "The Uses of a Collection of Historical Coins." Dr. James E. Talmage, of the Deseret Museum, Salt Lake City, then read the following paper:

POPULAR VERSUS SCIENTIFIC ARRANGEMENT OF MUSEUM EXHIBITS

In place of the somewhat extended paper I had intended to present on this subject, I shall content myself with a relatively brief statement;—this, in view of the fact that my topic has been very well treated in papers and discussions already heard at this meeting.

That the museum, as an institution, is primarily educational, requires neither demonstration nor argument. That the institution known by the generally accepted term "public museum" is for the enlightenment and betterment of the general public necessarily follows.

The value and importance of material for the specialist's use alone; in other words, the status of museum collections designed for research and for pioneer exploration in the domain of the yet unknown, is acknowledged as fully as is the purpose of the general museum, which stands as the classified repository of material illustrative of the realms of the known.

The distinction between college and university has been emphasized here. The one is a school for instruction, the other a laboratory or seminary for research. The one is for the many, the other for the comparatively few. The one calls for apparatus and material for demonstration, the other for appliances requisite for investigation. The museum of the specialist is comparable to the research laboratory of the university; the "public museum" is like unto the college class room.

The college sometimes attempts the special work of the university school, of necessity does it poorly, and retards its own progress in its legitimate field. Some museums are imperfectly defined as to their scope, with a marked tendency toward arrangement and display on the basis of technical or so-called "scientific" classification.

Consider the instance afforded by collections of minerals. The mineralogist knows where to look for the particular mineral he seeks, according to the scientific classification based on details of chemical composition. He will look for native copper in the case devoted to elements; cuprite, he finds among the oxids; chalcocite in a distant case containing only sulfids; malachite and azurite repose in the carbonate cabinet; and chrysocolla dwells with the silicates.

This is all right for the trained mineralogist; but the museum student of less specialized ability wants to examine the principal copper minerals, and is assisted in finding them in reasonably close companionship.

Are we not prone to regard classification as an end rather than as a means? I would not underrate the value of true classification, nor the importance of giving due expression thereto in a systematic arrangement of museum exhibits. But I know there are lessons to be taught by the specimen as an individual thing, apart from its relations to others of its kind.

A specimen duly identified and properly labeled is an index. By knowing its name we are able to locate its description in the literature of the subject; able to discover and to use what others have made known respecting it. But to know its name alone is of little value.

A season past I was traveling over one of our western deserts, riding alongside a man who was known as a systematic botanist. The plateau was carpeted in part by the delicate pink of the cranesbill or wild geranium blossoms. I questioned my companion as to the characteristics of special interest in connection with the little flowers. He told me in English, in Latin, and in a hybrid mixture of both, where the plant belonged in the botanist's scheme of arrangement; he discoursed on the distinguishing differences between the species *maculatum* and *dissectum*; and he told of the importance of the peculiar structure of the seed and its appendages as a means of identification and determination of species. To my surprise, I found that my learned friend had, after all, but a bare speaking acquaintance with the plant. That peculiarity of seed structure was an epitome of Nature's resource in adaptation. The plant is equipped for desert life; provision is made for the distribution of the seeds by means not known among other plants; it has a life history, to know which will make any man better and wiser. Eagerness to classify the rose may render one oblivious to its fragrance.

The museum must be more than a mere agglomeration of stuff; more than a storage vault for material however valuable in itself. Modern museum science emphasizes the distinction between exhibits for popular uplifting and the priceless collections of type specimens. Let the distinction be perpetuated, and in the arrangement of exhibits for the masses let the classification be that of service.

Chairman Lucas.—"Are there remarks on Dr. Talmage's paper?"

Dr. Daniel S. Martin (Department of Geology, Charleston Museum, Charleston, S. C.).—"I think he has presented an important aspect of the subject. I have long felt much the same way in regard to many of these things, and I am very glad he has brought it before us in the way he has. There are some points I might speak of, but there is not time at present, except to express my interest and sympathy."

Chairman Lucas.—"The next paper is by Dr. A. R. Crook, of the Illinois State Museum of Natural History, Springfield, Ill.

A SURVEY OF STATE NATURAL HISTORY MUSEUMS

This survey is the result of facts obtained by correspondence, by conversation, by consulting the returns obtained by our secretary, which he had the kindness to send me, and by consulting Merrill's report as published by the New York State Museum. The information obtained is more or less fragmentary but is presented as a nucleus—at least in my own mind—around which other facts may arrange themselves.

All the states and territories of the Union except New Hampshire, Massachusetts, Rhode Island, Connecticut, Delaware, South Carolina, Mississippi, Indian Territory, Oklahoma, Texas, New Mexico, Utah, Nevada, and Oregon have state museums and some of these may have such departments, though the writer lacks information concerning them. In brief, among forty-eight states, thirty-two, or two-thirds, have state museums.

In many instances these museums were begun as a direct result of the work of geological surveys. Such is the case in Maine, New York, New Jersey, Maryland, Virginia, Georgia, Alabama, Tennessee, Kentucky, Ohio, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, North and South Dakota, Nebraska, Wyoming, and Washington. In some cases this relationship has continued, while in others the departments are now separated. In Colorado and California the museums exist as departments of the State Bureau of Mines. In some states—for example, North Carolina—the museum is an adjunct to the department of agriculture.

Occasionally state museums have resulted from the bringing together of collections which were assembled on acccount of some national exhibition. For example, New Jersey prepared an exhibit for the World's Columbian Exposition in Chicago, and Louisiana for its exhibit in New Orleans, and these materials were wisely used by the state legislatures as a basis for state museums.

In many instances the museums are at the same locality and under the control of the state university. This often results both in advantage to the students of the institution and in the welfare of the museum, since various specialists in the university give the museum the benefit of their knowledge. This is the case in Maine, Virginia, Ohio, Michigan, Wisconsin, Minnesota, Iowa, Arkansas, North and South Dakota, Idaho, Washington, and Arizona.

In equipment, administration, and financing, state museums show great diversity. Some of them are not much more than a collection of a few odds and ends, looked after by one official only. He often gives but a portion of his time and receives but a few hundred dollars for all expenses, including his own remuneration. In other cases the institutions have millions of specimens magnificently housed. They are cared for by a force of thirty or more trained workers and have as much as forty thousand dollars annually for their work.

The fact that a museum is conducted by the state, while imposing upon it some especial obligations, does not remove from it the necessity of carrying out the work of the general museum. If it is a museum of natural history it should have collections of a general nature such as would be expected in any museum representing those subjects. But while a general museum is an epitome of the world, the state museum should be an epitome of the particular state in which it is located. It should have enough material to represent, however modestly, all the essential facts touched upon by the various departments treated, and above all should aim to be a store house and valuable treasury of the objects which characterize the natural history represented within its confines. For example, Illinois should have the most complete exhibit of fluorite possible; North Carolina of corundum; Maine of tourmaline; Arizona of malachite; New Mexico of turquoise; Wyoming of dinosaurs and fossil fishes. Unfortunately, at present, the archæology, zoölogy, botany, or mineralogy of but few states is best represented in their respective capitols. And the citizen who wishes to become conversant with these things which represent his immediate neighborhood is forced to seek for material in museums in distant cities. Possibly not more than three states, at present, approximate collections of such perfection as should characterize each commonwealth.

The city museum is chiefly occupied in administering to the population in its near vicinity. The state museum administers to a non-urban population as well as to the citizens of many cities. It should plan to perform a service not only for those who can visit it but also for people too remote or otherwise unable to come to it.

It should preserve and exhibit natural history treasures for the citizen in the remotest portions of its confines. A practical way to accomplish this is for the museum to furnish the high schools of the state with typical collections in various branches as is being so splendidly done by the

Philadelphia Museums and has been for three years advocated in Illinois. The simplest form is the permanent exhibit, since that requires less continuous work and expense such as follow from repeated reshipments, bookkeeping, correspondence, etc., though for permanent loan exhibits the initial work is greater, since many hundreds of collections must be provided. If a permanent exhibit loses the attractiveness which characterizes a freshly received package, the loss may be more than compensated for by the constant accessibility of the collections. If it is not rightly used, the fault lies with the local instructor and not with the institution making the gift.

Another form of activity which should characterize the state museum is that of participation in international, national, and regional expositions. The museum should have collections properly prepared for such service, so that, with minimum expense and trouble, attractive representations of the state could be made. In the newer states this would result in favorable advertising and for all the states it would be a contribution toward the common good. People unable to make long trips would have a truer conception of our great commonwealth and hence would be better business men, better citizens, better human beings.

It is sometimes intimated that the museum field is not one appropriate to the state government. Are the members of the American Association of Museums in a position to decide such a question? Can we take an attitude sufficiently Zangwillian—sufficiently altruistic—to answer either affirmatively or negatively according to the facts and irrespective of our own enthusiasm for museums?

Is it the function of a state to furnish the people with amusement? The impartial witness would reply that such is a legitimate function when the amusement is of such a nature as to make the people better citizens, and especially so when the materials furnishing the entertainment are being preserved for other necessary and valuable purposes.

That education is a legitimate function of government, is universally recognized whether the means be that of the common school, the university, or the museum. In the museum the work of education is especially justified since here are shown various steps in the progress of the community, steps which in some cases have been *per aspera ad astra*, while in others they have led through pleasant fields and by still waters. The museum as one of the most striking witnesses to the necessity of the conservation of natural resources is furnishing education of the greatest value to the present and coming generations. The fact that the museum can forcibly contribute to the financial prosperity of the people, by supply-ing information concerning raw materials and finished products, is one argument in its favor most readily admitted by legislators.

That state museums in many cases have not been more prosperous and efficient has often been due to primitive conditions in the government of the various states. Far too often the skill and exactness shown in the business and scientific world have been wanting. The custom, quite prevalent in departments of state service, of placing in charge men who are chosen for personal reasons rather than because of especial fitness has far too generally obtained. The presence of the "Fachman," so characteristic of the university and business world alike, has been conspicuous by his absence. But progress in this line is being made, and as the state employs lawyers in its legal department and medical men in its boards of health, and men of finance for conducting its banking system, so it will employ specialists in all the various departments, the museum included, just as rapidly as it advances from primitive conditions to those characterized by culture.

In this country many colleges and universities were inaugurated under private auspices or those of some religious organization. The state did not take up the work of higher education till later. But when that work was begun, phenomenal results followed, till to-day the state universities are among our greatest institutions and their promise in the future is beyond calculation. Similarly while the state has been behind private individuals, city governments, and scientific societies in the founding and development of museums yet it is probable that, as the wealth and culture of the people increase, state museums will develop into institutions which preserve records of vanished fauna and flora; which contain creditable quantities of well-arranged objects of natural history; which furnish exhibits for prominent expositions; which supply all schools with illustrations of the natural history of the state; and which are administered by trained and conscientious officials.

They will thus become magnificent institutions contributing to the entertainment, education, and profit of the people and making themselves felt as a dynamic force.

President Holland here resumed the chair.

Treasurer Wilson.—"There are a great many museums and some historical societies, that have magnificent museums of historical matter, which ought to be connected with this Association. I hope everyone will help and correspond with the Secretary or with me. We are including Canada and those countries to the south of us. I should be very thankful for any notification of such museums, or their directors and officers with whom we might correspond and give them invitations to join us. We wish to make this Association cover the museums of North and South America. The director of the National Museum of Bogota has written me during the past year. I meant to have read that letter to you. The directors of the different institutions outside of the United States are all interested, and we wish them to coöperate with us."

Mr. George Francis Dow (*Essex Institute, Salem, Mass.*).—"It seems to me there may be a considerable number of museums not familiar with our work; perhaps, not even possessed of the knowledge that such an association exists. Would it be at all lacking in dignity to make known in a definite printed circular our aims and the fact that we publish an annual volume, so that they may have it on their shelves?"

Secretary Rea.—"It was part of my idea in preparing this directory that it should serve as the basis of a campaign for increased membership."

Treasurer Wilson.—"Is this directory of museums intended to include the museums in Canada, Mexico, United States, and South America? If so, I am sure we shall have to prepare a small circular with great care and send it to all these foreign museums. I have letters from museums in the city of Mexico and from the National Museum in Bogota, and, I believe, from one of the museums in Buenos Aires, expressing cordial feeling for what we are doing, and one from Mexico, apologizing for not being able to attend this year."

President Holland.—"Our friends on the South American continent will be glad to aid. To a certain extent their sympathies and interests are with us."

Dr. James E. Talmage (*Deseret Museum, Salt Lake City, Utah*).—"These letters may well be incorporated in the volume of our *Proceedings*. I move that they be read and printed if desirable."

The motion was seconded and carried.

President Holland.—"We were invited, at Chicago, to hold our meeting in the year 1910 at Buffalo. A very cordial and pressing invitation was extended to us, and Buffalo is represented on this occasion by Mr. Howland and others. We shall be glad to hear from our friends in Buffalo whether the arrangement made last year will stand, because we understand that Cupid and Death have both had something to do in Buffalo since that invitation was extended to us."

Mr. Henry R. Howland (*Buffalo Society of Natural Sciences, Buffalo, N. Y.*).—"On behalf of the Buffalo Society of Natural Sciences, on behalf of the Buffalo Historical Society, the Albright Gallery, and the Buffalo Academy of Fine Arts, and on behalf of His Honor the Mayor of Buffalo, I desire to express the pleasure we feel in the acceptance last year of the invitation we extended to you, that you should meet with us in 1910. We anticipate great pleasure in the privilege of having you there. It has been suggested to the Council that the meeting might be made a little later than this year in order that Buffalo might begin to put on her spring dress. We shall welcome you to one of the most beautiful cities in the United States. We stand at some of the gateways of Paradise. Those who know Niagara Falls and the river and gorge have that pleasure in anticipation. We welcome you most gladly and an effort will be made to give you a most happy visit. On behalf of the Buffalo Society of Natural Sciences I desire to thank you for the acceptance of the offer that we should publish at our cost the Directory of Museums. That will give us great pleasure." (*Applause.*)

Upon motion of Mr. Frederic A. Lucas, it was voted that the Secretary and Council be empowered to fix the date for the Buffalo meeting, upon consultation with the local committee. A vote of thanks was extended through Mr. Howland to the authorities of the institutions who extended the invitation to meet in Buffalo.

Secretary Rea then read the following resolutions, which were unanimously adopted.

Resolved, That the heartfelt thanks of the American Association of Museums are hereby tendered to Dr. W. P. Wilson, Director of the Philadelphia Museums, and to his associates on the committee of arrangements, for the extremely generous and hospitable provision made by them for the entertainment of the Association.

Resolved, That the thanks of the Association are hereby tendered to Hon. John E. Reyburn, the Mayor of Philadelphia, for the cordial welcome extended by him to the Association.

Resolved, That the thanks of the Association are hereby tendered to Mr. John E. D. Trask, Secretary and Manager of the Pennsylvania Academy of Fine Arts; to the Trustees of the Pennsylvania Museum, and to Dr. Edwin Atlee Barber, Director of that Institution; to Dr. Arthur Erwin Brown, Secretary of the Zoölogical Society of Philadelphia; to the Trustees of the Drexel Institute, and to Dr. James MacAlister, the President of that Institute; to the Trustees and Gentlemen connected with the administration of the Philadelphia Museums; to the Trustees and Officers of the Free Museum of Science and Art; to Dr. Milton J. Greenman, and the Trustees of the Wistar Institute of Anatomy; to the Trustees and Officers of the Academy of Natural Sciences of Philadelphia; to the Authorities of the United States Mint; to the Wagner Free Institute of Science; to the Pennsylvania Historical Society; to the School of Industrial Art; to the School of Design for Women; to the American Philosophical Society; to the Franklin Institute; to the Normal Training High School and Library; and to the Philadelphia Girls' Normal School; for the kind entertainment and hospitality extended to the Association.

Resolved, That the thanks of the Association be extended to Dr. Thompson of the Philadelphia Public Library, to Dr. W. P. Wilson, and to other kind citizens of Philadelphia, who provided automobiles for the transportation of the members of the Association to different points of interest.

Treasurer Wilson then announced that, after a luncheon to be provided by the Academy, the Association would be conveyed by automobiles to inspect the United States Mint, the Free Library, the Wagner Free Institute of Science, the School of Design for Women, the Wagner Free Reference Library, and Independence Hall.

President-elect Lucas then took the chair and, after a vote of thanks to Dr. Holland had been passed, the Association adjourned to meet at Buffalo in 1910.

APPENDIX

CONSTITUTION OF THE AMERICAN ASSOCIATION OF MUSEUMS

ARTICLE I

NAME

The name of this Association shall be "The American Association of Museums."

ARTICLE II

OBJECT

The object of this Association shall be to promote the welfare of Museums, to increase and diffuse knowledge of all matters relating to them, and to encourage helpful relations among Museums and those interested in them.

ARTICLE III

MEMBERSHIP

All Museums officially represented at the first meeting of this Association, held at the American Museum of Natural History in New York, on May 15, 1906; all persons taking part in the organization of this Association, or who on the above date, or prior thereto, have by letter signified their wish to become members of the Association, shall become Charter Members on payment before the next annual meeting of the Association of the fees hereinafter provided for.

The Members of the Association shall be Active, Associate, Sustaining, and Honorary.

Persons actively engaged in the work of Museums may become Active Members on the payment of two dollars per annum, and may become Active Members for Life upon payment of thirty dollars at any one time.

Persons not actively engaged in the work of Museums, contributing five dollars per annum, may become Associate Members.

Each Museum paying not less than ten dollars a year shall be a Sustaining Member of the Association, and through its chief executive officer, or a properly accredited representative, shall be entitled to cast a vote on all matters coming before the Association.

Persons distinguished for eminent services, either to the cause of Museums or to this Association, may become Honorary Members. The number of Honorary Members shall be limited to fifteen. When ten Honorary Members have been elected then thereafter not more than two such members may be elected annually.

Active and Sustaining Members only shall have a right to vote, and Active Members only may hold office.

Any Museum or person proposed in writing for Active, Associate, or Sustaining Membership by a Member of the Association, and approved by the Council, upon the payment of the proper fee shall become a Member of the Association.

Any person contributing five hundred dollars or more at any one time shall become a Patron of the Association.

ARTICLE IV

OFFICERS

The officers of the Association shall be a President, two Vice-Presidents, a Secretary, and a Treasurer, and six other persons designated as Councillors, and these eleven shall constitute the Council. The President and two Councillors chosen by the Association shall retire annually, and for one year shall be ineligible for re-election to the same office.

ARTICLE V

COUNCIL

The general control of the affairs of the Association, except as otherwise herein provided, shall be vested in the Council.

ARTICLE VI

ELECTION OF OFFICERS

Officers shall be elected by ballot at the annual meeting.

The Council shall have power to fill any vacancies which may occur in its membership between annual meetings.

ARTICLE VII

MEETINGS

A general meeting shall be held in each calendar year. Special meetings may be appointed by the Association or called by the Council. The time and place of the annual meeting shall be determined by the Association. In order to diffuse a knowledge of Museums and their work, the Association shall meet in a different city or town each succeeding year, unless otherwise determined by the Association.

At the annual meeting papers may be read, matters relating to Museums discussed, and any business relating to the affairs of the Association shall be transacted.

Special meetings may be called by the Council in emergencies, and only matters stated in the call shall be considered at such special meetings.

REPORT OF THE TREASURER OF THE AMERICAN ASSOCIATION OF MUSEUMS PRESENTED AT THE ANNUAL MEETING, PHILADELPHIA, MAY 11–14, 1909

Balance on hand at meeting, May 5, 1908	$653.46

RECEIPTS

4 Active membership fees for year ending May 15, 1907	8.00
7 Active membership fees for year ending May 15, 1908	14.00
160 Active membership fees for year ending May 15, 1909	320.00
4 Active membership fees for year ending May 15, 1910	8.00
3 Sustaining memberships for year ending May 15, 1908	30.00
26 Sustaining memberships for year ending May 15, 1909	260.00
Sale of publication	1.00
J. H. Gest, Amount overpaid in error	8.00
Total receipts	$1302.46

EXPENDITURES

1908			
June 3, To Adams Express Co. (expressage)		$0.55	
June 3, To Adams Express Co. (expressage)		.75	
June 3, To Altemus & Co.		.10	
June 6, To P. M. Rea, as follows;			
The Charleston Museum (postage)	$3.23		
Daggett Printing Co. (printing)	5.00		
Henry Laurens (stenographic work)	5.20		
		13.43	
June 6, To Neil Satterlee (reporting proceedings)		90.80	
June 27, To Philadelphia Museums (printing)		2.90	
June 30, To Wm. H. Hoskins Co. (stationery)		.75	
July 1, Cash for postage stamps		.74	
July 2, To Philadelphia Museums (postage stamps)		4.00	
July 11, To Cincinnati Museum Association (refund of amount overpaid for J. H. Gest)		8.00	
July 20, To U. S. Express Co. (expressage)		.25	
July 21, To Henry Laurens (typewriting for secretary)		2.70	
July 25, To A. A. Clinger (stenographic and clerical work for treasurer)		5.00	
Aug. 10, To A. A. Clinger (stenographic and clerical work for treasurer)		5.00	
Carried forward		$134.97	$1302.46

	Brought forward	$134.97	$1302.46
1909			
Jan. 26,	To Philadelphia Museums (printing)	1.10	
Mar. 20,	To Paul M. Rea, Sec. (miscellaneous expenses)	41.27	
Mar. 22,	To Frederick O. Bemm (photographs of group)	2.00	
Mar. 23,	To Williams & Wilkins Co. (printing)	40.00	
Mar. 25,	To Philadelphia Museums (expressage)	1.20	
Mar. 30,	To Philadelphia Museums (printing)	2.00	
Mar. 31,	To Sassard Bros. (printing for secretary)	5.00	
Apr. 21,	To Williams & Wilkins Co. (Printing of *Proceedings* and reprints of papers)	360.30	
Apr. 29,	To Williams & Wilkins Co. (expressage)	3.89	
Apr. 30,	To A. A. Clinger (postage stamps)	9.00	
May 7,	To Paul M. Rea (postage, post cards, supplies, stenographic and clerical work)	38.72	
May 7,	To the Daggett Printing Co. (printing and envelopes)	17.00	
May 7,	To Whitehead & Hoag Co. (button badges)	6.00	
	Total expenditures		662.45
	Balance in treasury, May 10, 1909		$640.01

W. P. WILSON
Treasurer.

Examined and found correct:

GEORGE FRANCIS DOW,
FRANK C. BAKER,
O. C. FARRINGTON,
Auditing Committee.

MEMBERS OF THE AMERICAN ASSOCIATION OF MUSEUMS

LIFE MEMBERS

The asterisk (*) denotes a Charter Member.

Crook, A. R., Curator, Illinois State Museum of Natural History, Springfield, Ill.
*Hall, Robert C., Owner, Hall Museum of Anthropology, 240 Fourth Ave. Pittsburgh, Pa.
*Henshaw, Samuel, Curator, Museum Comparative Zoölogy, Harvard University, Cambridge, Mass.
*Holland, W. J., Director, Department of the Museum, Carnegie Institute, Pittsburgh, Pa.
*Minot, Charles S., Harvard Medical School, Boston, Mass.
*Talmage, James E., President, Deseret Museum, Salt Lake City, Utah.

ACTIVE MEMBERS

*Adams, Charles C., University of Chicago, Chicago, Ill.
Aitkin, Helen J., Assistant, Brooklyn Institute Museum, Brooklyn, New York.
*Akcley, C. E., Taxidermist-in-chief, Field Museum of Natural History, Chicago, Ill.
*Allen, J. A., Curator of Mammalogy and Ornithology, American Museum of Natural History, New York, N. Y.
*Ami, Henry M., Geological Survey of Canada, 453 Laurier Ave., East, Ottawa, Canada.
Atkinson, D. A., Custodian of Reptiles, Carnegie Museum, Pittsburgh, Pa.
Austin, Thomas L., Curator, Public Museum, Erie, Pa.
*Baker, Frank C., Curator, The Chicago Academy of Sciences, Lincoln Park, Chicago, Ill.
*Barber, Edwin Atlee, Director and Secretary, Pennsylvania Museum and School of Industrial Art, Fairmount Park, Philadelphia, Pa.
*Barbour, Erwin Hinckley, Curator, State Museum, Lincoln, Neb.
Beatty, John W., Director, Department of Fine Arts, Carnegie Institute, Pittsburgh, Pa.
*Bennett, Bessie, Assistant to the Director, The Art Institute of Chicago, Chicago, Ill.
*Bcrg, George L., Director, Washington State Art Association, Seattle. Wash.
Bethel, Ellsworth, President, Colorado Academy of Science, Denver, Col.
Beutenmüller, William, Curator, Department of Entomology, American Museum of Natural History, New York, N. Y.

Bibbins, Arthur Barnweld, Director of the Museum, Woman's College, Baltimore, Md.

Blackman, Elmer Ellsworth, Archæologist, Nebraska State Historical Society, Lincoln, Neb.

*Brigham, William T., Director, Bernice Pauahi Bishop Museum, Honolulu, H. I.

Brimley, Herbert H., Curator, North Carolina State Museum, Raleigh, North Carolina.

*Britton, N. L., Director-in-chief, New York Botanical Garden, Bronx Park, New York, N. Y.

Brown, Arthur Erwin, Vice-President, Academy of Natural Sciences; Director, Zoölogical Gardens, Philadelphia, Pa.

Brown, Stewardson, Academy of Natural Sciences, Philadelphia, Pa.

Brues, Charles Thomas, Curator of Invertebrate Zoölogy, Milwaukee Public Museum, Milwaukee, Wis.[1]

*Bryan, William Alanson, President, Pacific Scientific Institution, Box 38, Honolulu, H. I.

*Bryan, Mrs. William Alanson, Box 38, Honolulu, H. I.

*Bumpus, Hermon C., Director, American Museum of Natural History, New York, N. Y.

*Burchard, Edward L., Executive Secretary, Chicago School of Civics, 158 Adams St., Chicago, Ill.

Burkholder, C. H., Assistant to the Director, The Art Institute of Chicago, Chicago, Ill.

Carpenter, Newton H., Secretary, The Art Institute of Chicago, Chicago, Illinois.

*Clarke, Sir Casper Purdon, Director, Metropolitan Museum of Art, New York, N. Y.

Coggeshall, Arthur S., Preparator-in-chief, Department of Paleontology, Carnegie Museum, Pittsburgh, Pa.

*Collie, George L., Curator, Logan Museum, Beloit College, Beloit, Wis.

Comfort, George F., Director, Syracuse Museum of Fine Arts, Syracuse, New York.

*Comparette, T. Louis, Curator, Numismatic Collection, United States Mint, Philadelphia, Pa.

Cory, C. B., Curator of Zoölogy, Field Museum of Natural History, Chicago, Illinois.

Covert, Adolphe Boucard, Curator, University of Cincinnati Museum, Cincinnati, Ohio.

Cummings, Dr. Carlos E., Secretary, Buffalo Society of Natural Sciences, Buffalo, N. Y.

Dahlgren, B. E., Assistant Curator of Invertebrate Zoölogy, American Museum of Natural History, New York, N. Y.

*Dean, Bashford, Curator of Fossil Fishes, American Museum of Natural History; Curator of Arms and Armor, Metropolitan Museum of Art, New York, N. Y.

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[1] Now of the Bussey Institution, Harvard University

*de Forest, Robert W., Trustee and Secretary, Metropolitan Museum of Art, New York, N. Y.

*Dorsey, George A., Curator of Anthropology, Field Museum of Natural History, Chicago, Ill.

Douglass, Earl, Assistant in Research Section of Paleontology, Carnegie Museum, Pittsburgh, Pa.

*Dow, George Francis, Secretary and Curator of the Museum, Essex Institute, Salem, Mass.

*Dyche, L. L., Curator of Birds and Mammals, State University, Lawrence, Kansas.

*Eastman, Charles R., Curator of Vertebrate Paleontology, Museum of Comparative Zoölogy, Harvard University, Cambridge, Mass.

*Eigenmann, Carl H., Professor of Zoölogy and Dean of the Graduate School, Indiana University, Bloomington, Ind.; Curator of Ichthyology, Carnegie Museum, Pittsburgh, Pa.

Emerson, Alfred, Assistant to Director, The Art Institute of Chicago, Chicago, Ill.

Failing, Henrietta H., Curator, Portland Art Association Museum of Art, Portland, Oregon.

Fairbanks, Arthur, Director, Museum of Fine Arts, Boston, Mass.

*Farrington, Oliver C., Curator of Geology, Field Museum of Natural History, Chicago, Ill.

Fisher, Fannie, Assistant Curator, Illinois State Museum of Natural History, Springfield, Ill.

Foulke, J. B., Administrative Assistant, American Museum of Natural History, New York, N. Y.

*Fox, William Henry, Director, John Herron Art Institute, Indianapolis, Indiana.

*French, William M. R., Director, The Art Institute of Chicago, Chicago, Illinois.

Fuller, R. G., Assistant in Anthropology, Peabody Museum, Cambridge, Mass.

*Gallup, Anna Billings, Curator, The Children's Museum, Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y.

*Gest, J. H., Director, The Cincinnati Museum Association, Cincinnati, Ohio.

*Gilman, Benjamin Ives, Secretary, Museum of Fine Arts, Boston, Mass.

Glenk, Robert, Curator, Louisiana State Museum, New Orleans, La.

Glenn, L. C., Vanderbilt University Museum, Nashville, Tenn.

Goodale, George Lincoln, Honorary Curator, Harvard Botanic Garden, Harvard University, Cambridge, Mass.

*Goodyear, William H., Curator of Fine Arts, Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y.

Goll, George P., Curator's Assistant, Philadelphia Museums, Philadelphia, Pennsylvania.

*Gordon, G. B., Curator, Section of Ethnology, Free Museum of Science and Art, Philadelphia, Pa.

Grant, U. S., Curator, Museum of the College of Liberal Arts, Northwestern University, Evanston, Ill.

Greenman, Jesse M., Assistant Curator of Botany, Field Museum of Natural History, Chicago, Ill.

*Greenman, Milton J., Director, The Wistar Institute of Anatomy, Philadelphia, Pa.

*Griffin, Delia Isabel, Director, The Fairbanks Museum of Natural Science, St. Johnsbury, Vt.

*Griffith, A. H., Director, Detroit Museum of Art, Detroit, Mich.

Grinnell, Joseph, Director, Museum of Vertebrate Zoölogy, University of California, Berkeley, Cal.

Gross, A. O., Taxidermist, Universty of Illinois Museum, Urbana, Ill.

Gueret, E. M., Assistant Curator, Division of Osteology, Field Museum of Natural History, Chicago, Ill.

*Hall, Christopher W., Curator, Geological Museum, University of Minnesota, Minneapolis, Minn.

Hartman, C. W., Curator of Archæology and Ethnology, Carnegie Museum, Pittsburgh, Pa.[1]

Hastings, George T., Assistant Curator, Philadelphia Museums, Philadelphia, Pa.

*Henderson, Junius, Curator of the Museum, University of Colorado, Boulder, Col.

*Hitchcock, Charles H., Curator, Butterfield Museum, Dartmouth College, Hanover, N. H.

*Hollick, Arthur, Curator, Department of Fossil Botany, New York Botanical Garden, New York, N. Y.

Hooper, Franklin W., Director, The Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y.

*Hornaday, William T., Director, New York Zoölogical Park, New York, New York.

*Houston, S. F., President, Department of Archæology, University of Pennsylvania, Philadelphia, Pa.

*Hovey, Edmund Otis, Associate Curator, Department of Geology, American Museum of Natural History, New York, N. Y.

Howe, Marshall A., Curator of the Museum, New York Botanical Garden, New York, N. Y.

Howland, Henry R., Superintendent, Buffalo Society of Natural Sciences, Buffalo, N. Y.

Hutchinson, Charles L., President, Board of Trustees, Art Institute, Chicago, Ill.

Hyett, William James, in charge of Paintings, Department of Fine Arts, Carnegie Institute, Pittsburgh, Pa.

Ives, Halsey C., Director, City Art Museum, Forest Park, St. Louis, Mo.

*Jenkins, L. W., Curator of Ethnology, Peabody Museum, Salem, Mass.

Jennings, Otto E., Assistant Curator of Botany, Carnegie Museum, Pittsburgh, Pa.

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[1] Now Curator, Ethnographical Museum, Stockholm, Sweden.

Jennings, Mrs. Otto E., Assistant in Section of Botany, Carnegie Museum. Pittsburgh, Pa.

*Johnson, Charles W., Curator, Boston Society of Natural History, Boston, Mass.

Jones, Lynds, Curator of the Museum, Oberlin College, Oberlin, Ohio.

*Kahl, Paul Hugo Isidor, Custodian, Entomological Museum, Carnegie Institute, Pittsburgh, Pa.

Katzenberger, George A., Curator, Museum of Carnegie Library, Greenville, Ohio.

Kent, Henry W., Assistant Secretary, Metropolitan Museum of Art, New York, N. Y.

*Kermode, Francis, Curator, Provincial Museum, Victoria, B. C.

Koehler, Robert, Director, Minneapolis School of Fine Arts, Minneapolis, Minn.

*Kunz, George F., Honorary Curator of Gems, American Museum of Natural History, New York, N. Y.

*Lamb, Daniel Smith, Pathologist, Army Medical Museum, Washington. D. C.

Levy, Florence N., Editor, Art Annual, 546 Fifth Ave., New York, N. Y.

*Lindahl, Josua, Late Director of the Museum, Cincinnati Society of Natural History, Cincinnati, Ohio. Address: 7732 Chauncey Ave., Chicago, Ill.

*Link, Gustave A., Taxidermist, Carnegie Museum, Pittsburgh, Pa.

Lippincott, Elsie, Librarian, Field Museum of Natural History, Chicago, Illinois.

Loomis, Leverett Mills, Director of the Museum, California Academy of Sciences, San Francisco, Cal.

*Lucas, Frederic A., Curator-in-Chief, Museums of Brooklyn Institute of Arts and Sciences, Brooklyn, N. Y.

MacAlister, Mary T., Curator of Museum of Drexel Institute, Philadelphia, Pa.

*MacCurdy, George Grant, Curator, Section of Anthropology, Yale University Museum, New Haven, Conn.

*McGee, W. J., Director, St. Louis Public Museum, St. Louis, Mo.

*McGuire, F. B., Director, Corcoran Gallery of Art, Washington, D. C.

McIlvaine, Mabel, Assistant, Metropolitan Museum of Art, New York, N. Y.

McIntosh, William, Curator, Natural History Museum, St. John, N. B.

Maddox, Robert D., Curator, Medical Museum, University of Cincinnati, Cincinnati, Ohio.

Madison, H. L., Curator, Park Museum, Providence, R. I.

Martin, Daniel S., Honorary Curator, Department of Geology, Charleston Museum, Charleston, S. C.

Meek, Seth E., Curator, Department of Ichthyology, Field Museum of Natural History, Chicago, Ill.

Mengel, Levi W., Director, Reading Public Museum, Reading, Pa.

Meyers, Ira B., Curator, School of Education Museum, University of Chicago, Chicago, Ill.

Miller, Paul C., Walker Museum, University of Chicago, Chicago, Ill.

*Mills, William C., Curator and Librarian, Ohio State Archæological and Historical Society, Ohio State University, Columbus, Ohio.

Millspaugh, Charles F., Curator of Botany, Field Museum of Natural History, Chicago, Ill.

*Miner, Roy W., Assistant Curator of Invertebrate Zoölogy, American Museum of Natural History, New York, N. Y.

*Montgomery, Henry, Curator of the Museum, University of Toronto, Toronto, Ontario.

Moorehead, Warren K., Curator, Department of Archæology, Phillips Academy, Andover, Mass.

Morris, E. L., Curator of Natural Science, Brooklyn Institute Museum, Brooklyn, N. Y.

*Morse, Edward S., Director, Peabody Museum, Salem, Mass.

*Morse, Silas R., Curator, New Jersey State Museum, Trenton, N. J.

*Nachtrieb, Henry F., Curator, Zoölogical Museum, University of Minnesota, Minneapolis, Minn.

Nichols, Henry W., Assistant Curator of Geology, Field Museum of Natural History, Chicago, Ill.

*Nutting, Charles C., Curator, Museum of Natural History, State University of Iowa, Iowa City, Iowa.

Ortmann, Arnold E., Curator of Invertebrate Zoölogy, Carnegie Museum, Pittsburgh, Pa.

Paarmann, J. H., Curator, Davenport Academy of Sciences, Davenport, Iowa.

Perine, Clara N., Assistant to the Director, Wistar Institute of Anatomy, Philadelphia, Pa.

*Peterson, Harry C., Curator, Leland Stanford Jr. Museum, Palo Alto, California.

*Peterson, Olaf August, Field Collector and Preparator of Mammals and Birds, Carnegie Museum, Pittsburgh, Pa.

Pickard, John, University of Missouri, Columbus, Mo.

Pitkin, Albert H., Associate of the Wadsworth Athenæum, Box 867, Hartford, Conn.

Pollard, Charles Louis, Curator-in-Chief, Staten Island Association of Arts and Sciences, New Brighton, N. Y.

Prentice, Sydney, Artist and Illustrator, Carnegie Museum, Pittsburgh, Pa.

Putnam, Edward K.. Acting Director, Academy of Sciences, Davenport, Iowa.

*Putnam, Frederick W., Honorary Curator, Peabody Museum, Harvard University; Professor Emeritus of Anthropology, University of California. Address: Cambridge, Mass.

Ranck, Samuel H., Librarian, Grand Rapids Public Library, Grand Rapids, Mich.

*Rathbun, Richard, Assistant Secretary, Smithsonian Institution, in charge U. S. National Museum, Washington, D. C.

*Rathmann, C. G., Director, Educational Museum, St. Louis, Mo.

*Raymond, Percy E., Assistant Curator of Invertebrate Zoölogy, Carnegie Museum, Pittsburgh, Pa.

*Rea, Paul M., Director, The Charleston Museum, Charleston, S. C.

Riggs, Elmer Samuel, Assistant Curator of Paleontology, Field Museum of Natural History, Chicago, Ill.

Robinson, Edward, Assistant Director, Metropolitan Museum of Art, New York, N. Y.

Rothermel, John G., Superintendent, Wagner Free Institute of Science, Philadelphia, Pa.

*Rothrock, Boyd P., Curator, Division of Zoölogy, Pennsylvania State Museum, Harrisburg, Pa.

Rothrock, Mrs. Boyd P., Division of Zoölogy, Pennsylvania State Museum, Harrisburg, Pa.

Ruthven, A. G., Curator of the Museum, University of Michigan, Ann Arbor, Mich.

Sage, Cornelia Bently, Assistant Director, Albright Art Gallery, Buffalo, N. Y.

Santens, Jos. A., Preparator, Taxidermic Laboratory, Carnegie Museum, Pittsburgh, Pa.

*Santens, Remi H., Preparator, Taxidermic Laboratory, Carnegie Museum, Pittsburgh, Pa.

Schoff, Wilfred H., Secretary and Assistant Treasurer, The Philadelphia Museums, Philadelphia, Pa.

*Schuchert, Charles, Curator of Geology, Peabody Museum, Yale University, New Haven, Conn.

Severence, Frank H., Secretary, Buffalo Historical Society, Buffalo, N. Y.

Shafer, John A., Custodian of the Museums, New York Botanical Garden. Bronx Park, New York, N. Y.

*Sherwood, George H., Assistant Secretary and Treasurer, American Museum of Natural History, New York, N. Y.

*Skiff, Frederick J. V., Director, Field Museum of Natural History, Chicago, Illinois.

Skinner, Henry, Academy of Natural Sciences, Philadelphia, Pa.

Small, John K., Head Curator of the Museums and Herbarium, New York Botanical Garden, Bronx Park, New York, N. Y.

Smith, Frank, Curator, University of Illinois Museum, Urbana, Ill.

Smith, Lee H., Vice President, Buffalo Society of Natural Sciences, Buffalo, New York.

*Smith, T. Guilford, President, Buffalo Society of Natural Sciences, Buffalo, N. Y.

Stevenson, Mrs. Cornelius, Assistant Curator and Lecturer, Pennsylvania Museum and School of Industrial Art, Philadelphia, Pa.

Stewart, Douglas, Assistant to the Director, Carnegie Museum, Pittsburgh, Pennsylvania.

*Stone, Witmer, Assistant Curator, Academy of Natural Sciences, Philadelphia, Pa.

Stotsenberg, J. MacPherson, Curator, Wistar Institute of Anatomy Philadelphia, Pa.

Strecker, John K., Jr., Baylor University Museum, Waco, Tex.

Swarth, Harry S., Curator of Ornithology, Museum of Vertebrate Zoölogy, University of California, Berkeley, Cal.

Toothaker, Charles R., Curator, The Philadelphia Museums, Philadelphia, Pennsylvania.

*Tower, Ralph W., Curator of Physiology, American Museum of Natural History, New York, N. Y.

*Townsend, Charles H., Director, New York Aquarium, Battery Park, New York, N. Y.

*Townsend, Louis H., Osteologist, Carnegie Museum, Pittsburgh, Pa.

Trask, John E. D., Secretary and Manager, Pennsylvania Academy of Fine Arts, Philadelphia, Pa.

Tuttle, W. F., Administrative Assistant, The Art Institute of Chicago, Chicago, Ill.

Van Horn, Mary, Acting Librarian, The Art Institute of Chicago, Chicago, Ill.

Wagenseller, B. Meade, Assistant, Philadelphia Museums, Philadelphia, Pa.

*Ward, Henry L., Director, Public Museum of the City of Milwaukee, Milwaukee, Wis.

Weller, Stuart, Curator, Walker Museum, University of Chicago, Chicago, Illinois.

*Wilcomb, C. P., Curator, Oakland Public Museum, Oakland, Cal.

*Willoughby, Charles C., Assistant Curator, Peabody Museum, Harvard University, Cambridge, Mass.

*Wilson, W. P., Director, The Philadelphia Museums, Philadelphia, Pa.

*Wissler, Clark, Curator of Anthropology, American Museum of Natural History, New York, N. Y.

Woodruff, Frank M., Ornithologist, The Chicago Academy of Sciences, Chicago, Ill.

Worth, William A., Director, Educational Museum, 500 Park Ave., New York, N. Y.

Zeller, August, Assistant, Department of Fine Arts, Carnegie Institute, Pittsburgh, Pa.

*Zierden, Alicia M., Curator, Division of Education, Pennsylvania State Museum, Harrisburg, Pa.

SUSTAINING MEMBERS

Academy of Natural Sciences of Philadelphia, Philadelphia, Pa.

*American Museum of Natural History, 77th St. and Central Park, West, New York, N. Y.

*The Art Institute of Chicago, Chicago, Ill.

*Brooklyn Institute Museum, Eastern Parkway, Brooklyn, N. Y.

*Carnegie Museum, Department of The Carnegie Institute, Pittsburgh, Pa.

*The Charleston Museum, Charleston, S. C.

*The Chicago Academy of Sciences, Lincoln Park, Chicago, Ill.

Cincinnati Museum Association, Cincinnati, Ohio.

*The Corcoran Gallery of Art, Washington, D. C.
*The Deseret Museum, Salt Lake City, Utah.
Essex Institute, Salem, Mass.
*The Fairbanks Museum of Natural Science, St. Johnsbury, Vt.
*The Field Museum of Natural History, Chicago, Ill.
*Free Museum of Science and Art, Department of Archæology, University of Pennsylvania, Philadelphia, Pa.
*John Herron Art Institute, Indianapolis, Ind.
*Metropolitan Museum of Art, New York, N. Y.
Museo Nacional de Bogota, Bogota, Columbia.
Museum of the College of Liberal Arts, Northwestern University, Evanston, Ill.
*Museum of Fine Arts, Boston, Mass.
*New York Botanical Garden, Bronx Park, N. Y.
*New York State Museum, Albany, N. Y.
Peabody Museum, Salem, Mass.
*Pennsylvania Museum and School of Industrial Art, Memorial Hall, Fairmount Park, Philadelphia, Pa.
The Philadelphia Museums, 34th St., below Spruce, Philadelphia, Pa.
*Public Museum of the City of Milwaukee, Milwaukee, Wis.
St. Louis Museum of Fine Arts, St. Louis, Mo.
Syracuse Museum of Fine Arts, Syracuse, N. Y.
University of Nebraska, Lincoln, Neb.
Wadsworth Athenæum, Hartford, Conn.
Walker Museum, University of Chicago, Chicago, Ill.
*Washington State Art Association, Seattle, Wash.
*Williams College Library, Williamstown, Mass.

NECROLOGY

GEORGE CORLISS

Member of the American Association of Museums since 1908. Assistant to the director of the Art Institute of Chicago, Illinois. For many years an officer of the Pennsylvania Academy of Fine Arts. Actively associated with the preparation of art exhibits in the Columbian Exposition in Chicago, and the Louisiana Purchase Exposition in St. Louis.

Born in Philadelphia, Pennsylvania, in 1839. Died in Chicago, Illinois, September 4, 1908.

CHARLES M. KURTZ, A.M., Ph.D.

Charter member of the American Association of Museums. Director of the Buffalo Academy of Fine Arts. For many years actively associated with journals and expositions of fine arts. Awarded diploma and medal by the Trans-Mississippi International Exposition of 1898, and gold medal of the St. Louis Exposition in recognition of services. Appointed an officer of the Order of Merit by Prince Ferdinand of Bulgaria, in 1905. Member of many societies devoted to fine arts.

Born in Newcastle, Pennsylvania, March 20, 1855. Died in Buffalo, New York, March 21, 1909.

OTIS TUFTON MASON, Ph.D., LL.D.

Charter member of the American Association of Museums. Head curator of ethnology in the United States National Museum, Washington. Honorary and corresponding member of many American and European scientific societies. Author of numerous books and papers on ethnology.

Born in Easton, Maine, April 10, 1838. Died November 5, 1908.

CHARLES CHAUNCEY MELLOR

Charter member of the American Association of Museums. Member of the Board of Trustees of the Carnegie Institute of Pittsburgh, Pennsylvania, and chairman of the committee on the Museum. Member of many societies of art and science.

Born in Pittsburgh, Pennsylvania, September 26,1836. Died April 2, 1909.

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